April 6, 1950

BRITISH DENTAL JOURNAL

The Journal of the British Dental Association

(Incorporating the "Mouth Mirror" and the "Dental Gazette")

First and Third Fridays in each month

Price to non-members - 2s. per copy. Postage 3d. Annual Subscription £2 2s. post free

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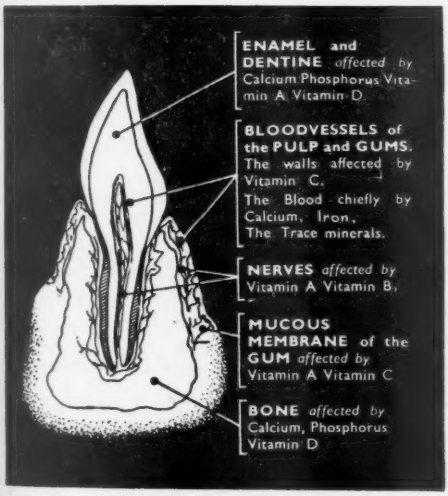
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BRITISH DENTAL JOURNAL

The Journal of the British Dental Association

VOL. LXXXVIII APRIL 6, 1950 No. 7

ORIGINAL COMMUNICATIONS

A TOOTH GERM FROM A CASE OF SCURVY

BY MARTIN A. RUSHTON, M.D., F.D.S. R.C.S.ENG.

THERE are few descriptions of human tooth germs from cases of scurvy though the experimental effects found in animals have been thoroughly studied.

The specimen to be described was obtained from a child of four years who suffered from mental deficiency and had been living on a diet almost devoid of vitamin C. He had bleeding gums and a lesion of the hip which may have been scorbutic. During the extraction of severely decayed deciduous teeth a premolar germ was removed. The specimen and relevant information were kindly supplied by Dr. P. R. Evans, Director of the Department of Child Health at Guy's Hospital.

Sections showed a premolar tooth in which root formation had just begun on the labial side. The pulp contained numerous hæmorrhages, some extensive. Nearly all had occurred at the periphery of the pulp, either between the odontoblast layer and the predentine or in the basal layer of Weil (fig. 1). The most severe hæmorrhage had occurred under the centre of the occlusal surface and here part of the predentine layer had been stripped up from the dentine, presumably by the violence of the bleeding (fig. 2). Wherever hæmorrhage had occurred beneath the predentine many erythrocytes had entered the dentinal tubules (fig. 3) producing an appearance similar to that reported in a fracture case (Rushton, 1949). It is likely that some of these hæmorrhages occurred during the removal of the tooth germ, though it is hardly probable that the tooth germ was actually grasped in the forceps. Since premolar germs accidentally removed do not usually show extensive hæmorrhages the latter may be ascribed to the capillary fragility of scurvy. There is evidence, however, that many hæmorrhages had already occurred before the tooth germ was removed. In several places the odontoblast

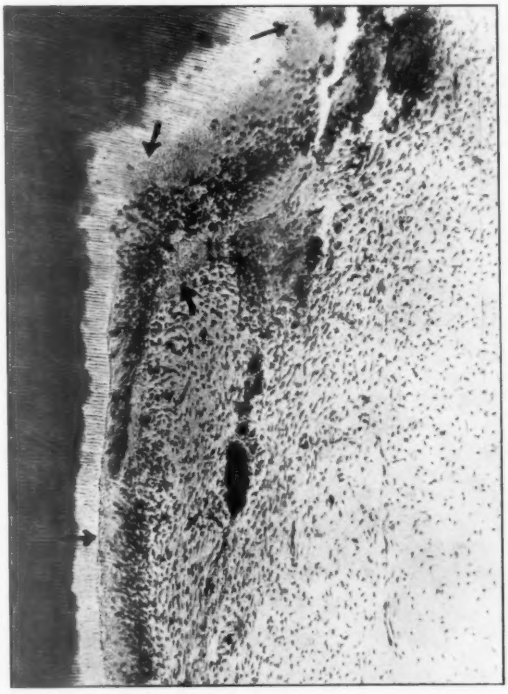

FIG. 1.—The odontoblast layer has become convoluted and there are recent hæmorrhages next to the predentine and within the pulp (arrows). The calcified area represents an old hæmorrhage. × 90. Hæmatoxylin and eosin.

FIG. 2.—Severe hæmorrhage (H) under centre of occlusal surface extending into pulp. The predentine with odontoblasts has been stripped up. × 70. van Gieson.

FIG. 3.—Site of old hæmorrhage between predentine and odontoblast layer (O) which is displaced. Red cells in dentinal tubules. × 320. Mallory.

FIG. 4.—Same area as fig. 3 to show connective tissue at site of old hæmorrhage between predentine and odontoblasts. × 330. van Gieson.

layer had been at some time lifted away from the predentine by a hæmorrhage and in one of these the intervening space is now occupied by delicate connective tissue (fig. 4). The dentinal tubules opposite this area still contain red cells, showing that it was a hæmorrhage which caused the displacement (fig. 3). In another place remnants of a rather more recent hæmorrhage beneath the predentine are visible and calcification of some material has begun just on the pulp side of the predentine (fig. 5).

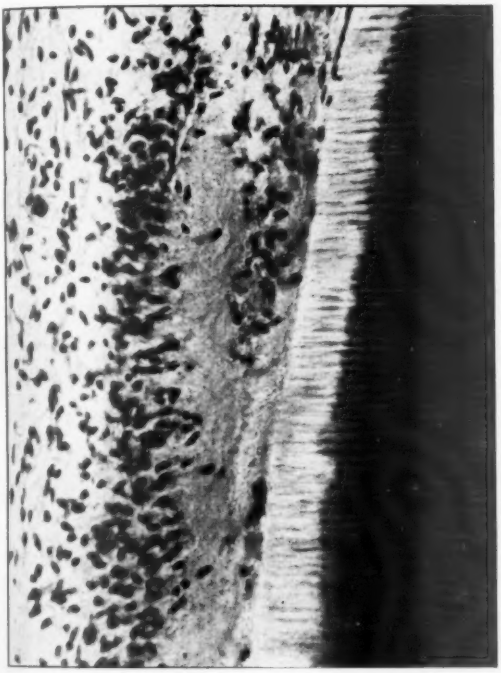

FIG. 5.—The odontoblast layer has been raised from the predentine by a hæmorrhage, not very recent. Calcification has occurred on the pulp side of the predentine. × 320. Hæmatoxylin and eosin.

In the odontoblast layer the cytoplasm of the odontoblasts has become indistinct, especially that of the older cells, their layer has become convoluted and in many places they have become separated from the predentine by a homogeneous substance which is not collagen.

The predentine is quite wide and shows no evidence of abnormal calcification, but there are small calcified deposits in one or two places on the pulp side of it related to sites of hæmorrhage.

The body of the pulp shows rather little change but there are a few areas of calcification which represent sites of a former hæmorrhage (fig. 1) of which remnants can still be seen.

Westin has described the changes produced by scurvy in the human tooth in very great detail. Much of this (1931) refers to the teeth of adults but some (1937) deals with erupted children's teeth of both dentitions. Many of the changes he records are not seen in the present specimen, probably because in this case the condition was not of such long standing but possibly also on account of the immaturity of the tooth—such are œdematous changes, gross disappearance of the odontoblast layer, porosity of the dentine, reticular atrophy of the pulp with formation of mature fibrillary tissue, degenerative calcification of vascular walls, etc. He shows, however, old and more recent hæmorrhages between the predentine and odontoblasts, and mentions laceration of the embryonic pulp tissue which is a striking feature of the specimen here shown. Among the features which one might have expected to find is amorphous calcification along the whole pulp side of the predentine: such a thing is only seen in one or two spots (fig. 5). There is also no evidence of the formation of abnormal collagenous matrix or of any recent change in the number or morphology of the dentinal tubules. These things suggest a severe deficiency of quite recent date.

I am obliged to Mr. J. F. Dudley, A.I.M.L.T., for the preparation of the specimen and to Mr. J. E. Hutchinson for the photomicrographs.

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REPORT ON CARIES CONTROL

By J. R. TOLLER, L.D.S.Eng.

Introduction

Gottlieb's views on the pathology of dental caries are fully presented and discussed in his book "Dental Caries" [1]. Three more recent contributions should also be consulted [2, 3, 4]. Here it is sufficient to say that in his view the organisms which produce caries invade through the organic enamel sheaths and lamellæ in the case of enamel and in the case of dentine through the dentinal tubules. These routes are called the invasion roads. The dissolution of the inorganic part of the tooth by acids is secondary. This is not in accord with what may be called the classical view. It may be said that in Gottlieb's view we have been barking up the wrong tree since the first publication of Miller's views between 1880 and 1890.

In Gottlieb's view, in those immune to caries, the exposed organic portion of the dental hard tissue, the tooth surface bathed in saliva, is probably calcified, thus rendering it impervious. It is considered to be a salivary action not understood at present. Soluble fluorides are said to give some degree of immunity to caries when topically applied to teeth. Because of the great affinity of fluorine for calcium, calcification of the organic surfaces of the teeth is probably caused. Organic tissue is impregnated with a soluble salt of fluoric acid which then rapidly changes into calcium fluoride which is insoluble in water. The organic invasion roads are therefore obstructed. Tests of this method of caries prophylaxis are being made on the most massive scale in North America at the present time and are receiving much publicity in the lay press there. A recent report on this method, communicated to this Journal, however, is not encouraging [6]. Ammonia in tooth pastes, first suggested by Grove and Grove [7], probably works similarly to fluorides by calcifying the organic roads [2] and the use of alkalis (ammonium or sodium bicarbonate) in tooth pastes is recommended home care.

It follows from Gottlieb's views that the successful coagulation of the invasion roads and/or the precipitation of water insoluble salts in them would obstruct them and make them impervious. Thus the organisms that initiate the caries process could not invade the tooth and the process of caries would be nipped in the bud. Sensitivity of dentine is conducted to the pulp by these same invasion roads. Coagulants or precipitations that desensitise teeth would therefore prevent caries and *vice versa*. When sensitivity is present, in a very short time we can check either the efficiency of our drugs used to obstruct the invasion roads or the efficiency of our individual technique of applying the drugs; if satisfied with the drugs used and our method of using them, we can readily check the major premise itself on the principle that the proof of the pudding is in the eating. The procedure may be likened to putting millions of corks into millions of microscopic holes. The corking must be done without damaging the patient or discolouring the tooth. Before attempting caries prophylaxis it is best to get some experience in the use of the drugs in operative procedures with the help of the measuring rod of sensitivity.

Some difficulty was at first caused because, though precipitated silver nitrate is a most useful obstructor of invasion roads, it is apt to cause discoloration. Although this drug was used pending the discovery of an æsthetically more acceptable alternative, it still remains an obstructor of choice where æsthetics are of no consequence even now that a satisfactory alternative has been found. But it cannot be said that any procedure is so good that it cannot be improved. Continuous work is being done to improve the chemical obstruction of the invasion roads. Changes in the drugs used when better are found, and in the methods of their use as clinical experience increases may be expected. The object, however, will remain the same: the most effective obstruction of invasion roads possible.

The present writer used the *impregnation* of tooth surfaces (as the procedure is called) in operative procedures for desensitising sensitive exposed cervical dentine in mature patients, and in cavities before filling, long before he became interested in caries control. He can report that only in 3 cases—where sensitive dentine appeared to be exposed in gingival sulci that did not justify excision but made it impossible to dry the dentine—did he fail completely to desensitise dentine. The use of adrenalin chloride as a reducer of silver nitrate was not at that time appreciated or he might have succeeded. Sometimes in intractable cases three impregnations were made at intervals of days before desensitisation was established, and sometimes alternative methods were used on the same or different occasions. It cannot be stressed sufficiently that dryness is essential and the use of rubber dam and compressed air a *sine qua non*. There is no need to risk injuring the pulp by desiccating the tooth, but unless it is quite certain that the area to be impregnated is dry before the application of the solutions failure will result. It is difficult, if not impossible, to persuade water into a body already saturated with it.

It is suggested as a result of his experience that there might be less trouble under acid cements if cavities were impregnated as a routine before the insertion of the cement. Small cavities requiring

silicate restorations need no lining after impregnation and no apparent trouble has followed even large silicate fillings when the cavities were impregnated before they were lined. The conclusion of Younger is justified: "Impregnation is the most effective procedure known for protection of the pulp and against sensitivity under restorations of all kinds. Its use for this purpose will justify its inclusion in the technique of the careful operator, regardless of its caries inhibiting value" [5].

Technique of Impregnation

The following are Gottlieb's instructions for impregnation[1]: " Impregnation is a very simple procedure and must be carried out in a very dry field. Bite-wing X-ray films are necessary for satisfactory examination. All questionable teeth should be properly treated or extracted.

(1) The tooth area should be properly cleansed and polished with pumice.

(2) The area to be impregnated must be properly isolated with cotton rolls or rubber dam. The teeth must be thoroughly dried, preferably with an air line and not a chip blower.

(3) Apply benzine U.S.P. as this removes any oily deposit. If the rubber dam is used, cleanse with hydrogen peroxide, followed with 95 per cent grain alcohol, as the benzine dissolves the latex in the dam.

(4) Use a wetting agent, such as Nacconol in distilled water, 1 per cent solution, for the purpose of lowering the surface tension. The interproximal areas may be reached by means of dental floss.

(5) With cotton pellets in a dappen dish, apply 40 per cent zinc chloride solution and leave for one minute ; then precipitate with a 20 per cent potassium ferrocyanide solution, rubbing constantly during the process.

(6) This procedure does not produce any discoloration. It is to be used in control of caries, under all operative procedures, jackets, crowns, partial appliance insertions, inlay and alloy preparations, synthetic porcelain and gold foil preparations and the desensitisation of all gingival areas, denuded dentine in parodontal treatment and orthodontics.

In orthodontic prophylaxis the teeth should be impregnated at three intervals prior to the placing of the orthodontic appliances.

(7) All pit and fissure areas should be impregnated and placed under observation for further examination. Often these areas may need restorations as they may have biological discrepancies which are not readily detected by a routine examination. In many cases, impregnation has controlled these deficiencies, but only through observation can we be sure of the results. In juvenile practice, all smooth surface areas should be impregnated every three or four months until the patient reaches the age of 16 or 17. In an adult, good judgment should be exercised.

(8) In young children it is sometimes impossible to keep the field dry. Here we follow the same procedure as in the zinc chloride-potassium ferrocyanide sequence but use silver nitrate and precipitate with adrenalin chloride 1 : 100 or 1 : 1,000 concentrate.

We have the same principle in the silver nitrate treatment as in zinc chloride, with faster acting compounds, and still a process of coagulation and precipitation. The silver nitrate is of 10 per cent strength in distilled water and is applied with pellets and rubbed in. It is advisable to leave for at least thirty seconds and precipitate immediately with adrenalin chloride. Repeat this process two or three times. A check of all hæmorrhage and weeping from soft tissue will be noted.

In this manner we have a fine control in posterior gingival areas of second and third molars. In many cases, by using a thorough impregnation, a cement base can be eliminated.

Do *not* use the silver nitrate technique in anterior teeth and *never* on any synthetic porcelain restorations as it will cause discoloration.

The following chemicals are required:

Zinc chloride 40 per cent, potassium ferrocyanide 20 per cent, silver nitrate 10 per cent and Nacconol 1 per cent—all solutions in distilled water. (Nacconol powder may be had from the National Aniline Dye, Inc., 40, Rector Avenue, New York City.)

Benzene and adrenalin hydrochloride 1:100 or 1:1,000."

Nacconol is a wetting agent and is, it appears, unprocurable in this country. It is harmless to the tissues. A drop or two of its solution is added to the other solutions in dappen glasses immediately before use. The present writer uses the sequence o zinc chloride, potassium ferrocyanide and silver nitrate for caries prophylaxis except in anterior teeth in which there are cement fillings when the silver nitrate is omitted. The silver nitrate will discolour posterior amalgam or gold restorations but does not appear to harm them. He uses brushes (ordinary polishing brushes) to brush in the solutions. Narrow cotton or linen tapes, cut to suitable lengths, are used to rub the solutions into the interproximal tooth surfaces.

The operation is painless. It should be borne in mind that the drugs used have a vile taste and at these concentrations they may be harmful to the soft tissues. If and when the procedure of impregnation becomes established there would seem to be no reason why persons with considerably less training than dentists could not be trained to do it. Since the procedure prevents and does not arrest decay and very small beginning decays are clinically impossible to detect, it is not suggested that a 100 per cent reduction of caries will follow impregnation, though on theoretical grounds a 100 per cent reduction could follow regular, thorough impregnations after a sufficient lapse of time for existing caries to become detectable clinically and be dealt with.

[1] Personal communication.

Previous "Field" Tests

Reports have already been published in America by "field" workers who have tried this method of caries prophylaxis. They are uniformly encouraging and report an 80–90 per cent reduction of caries. The caries in numbers of patients one year prior to impregnation were compared with the caries one year following impregnation.

Crawford reports a reduction of 82½ per cent and says "we believe that the fact that we missed the 100 per cent mark by a 17½ per cent margin is due to several factors, the greatest of these probably being moisture." He used cotton rolls to control moisture. His survey comprised 81 people [8].

Boelsche reports an 86·9 per cent reduction of caries in a survey covering 90 cases over five years, Gillard an 84·5 per cent reduction in 54 cases over one year, and Summers an 87·9 per cent reduction in 50 patients over one and a half years [9].

Younger obtained an 80–90 per cent reduction in 83 cases in one year in which he impregnated the whole mouth, and a 75 per cent reduction in 63 cases in which he impregnated half the mouth [10].

Kalmans and Burgess report in one group of 38 patients, aged 4 to 65, a reduction of 63·5 per cent, in another group of 33 patients a reduction of 87·4 per cent [11].

Report of Present Test

In the "field" test on 119 children, aged 7 to 11 years, of which a report is here presented, one-half of the upper jaw was impregnated and the other half left as a control. Of these children many never cleaned their teeth, the majority of them rarely did so. Their dental condition was bad; they were not immune to caries. They had to be made dentally fit before they could be used experimentally. When all unsavable teeth were removed and all cavities filled, quite often they were left top and bottom with isolated first permanent molars and an isolated group of anterior permanent teeth. When there was any doubt whatever about a fissure, a filling was inserted. Some few hundred teeth were removed or had previously been removed. All had all their teeth cleaned and polished some days prior to impregnation and received a further polishing immediately before impregnation. This work was done in the course of "routine" school dental treatment and the patients remained unaware that they were the subjects of an experiment.

A difficulty was that this work was done in an area totally lacking the most elementary facilities; it was all done in the classrooms of rural schools often without benefit of reasonable light, let alone plumbing and radiographic apparatus for precision diagnosis.

With very few exceptions, only cases with isolated upper first permanent molars round which it was possible to see—as well as work—were selected. This did not entail the discarding of many children. Absence of plumbing prohibited dams. The teeth were impregnated *one at a time* and when there was any doubt whatever that saliva had eluded the cotton rolls and contaminated the tooth, the tooth was impregnated again. Many were impregnated twice.

Under these conditions the work took up much time. For timing purposes the present writer took an opportunity that presented itself to do some impregnations in a well-equipped surgery for a few young adults. All were cared for dentally; they had upwards of 23 teeth each and none had more than 6 restorations. To impregnate the whole mouth took an average of fifty-eight minutes. Each quarter of the mouth was dammed and done *en bloc*. Preliminary polishing took thirty-five minutes. Although these patients had negligible stains and very little tartar it should be remembered that every surface—especially the interproximal areas—must be thoroughly polished immediately before impregnation.

This report is submitted because the present writer will shortly cease to have access to these patients. He had intended to watch them over a period of two years. It is hoped to begin afresh elsewhere. Meanwhile, other school dentists may become interested. Further tests on the most massive scale are justified.

Number of children impregnated aged 7–11 years ...	119
Number of teeth impregnated: Primary	19
Secondary	354
Number of teeth not impregnated: Primary... ...	19
Secondary ...	354
Number of cavities in teeth impregnated after six months' interval	16
Number of cavities in teeth not impregnated after interval of six months	105
Percentage reduction	84·8

Of these cavities one was in a primary tooth among the impregnated teeth and one was in a primary tooth among the controls. Of all these cavities only 10 occurred in anterior secondary teeth—3 in one patient and in impregnated teeth. In further tests among young children of this age it is suggested that attention is confined to the first permanent molars. A further 111 children, aged 7 to 11 years, were impregnated, but it will be impossible to report upon them all. Of these 111 one group of 54 show a reduction of 89 per cent after four months: the remainder were impregnated so short a time ago that they have not been inspected since impregnation. While it should not be difficult to decide in an individual child at what interval of months impregnation should be done, it is very difficult at this stage to decide at what intervals large numbers should be done.

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A BRIEF SURVEY OF BRITISH DENTISTRY[1]
CHARLES ALLEN — DENTISTS ACT, 1878

By J. MENZIES CAMPBELL, F.R.S.E., D.D.S.Toronto, L.D.S.Ont., L.D.S.Glas.

As far as is at present known, the first English book entirely devoted to dentistry, "The Operator for the Teeth," was written by Charles Allen, and published in York in 1685. It does appear strange that no reference was made to it by such later writers as Hurlock, Berdmore, Hunter, or Fox. What is still more astounding is the fact that, for 239 years, the first edition remained unrecorded in any medical, dental, or other, bibliography. Details are very meagre concerning the author; practically all that is known is what he, himself, wrote in his Prefaces.

He believed that decay and loss of teeth constituted a major deformity, and he aimed at preventing these. He drew attention to the rôle, which teeth play in supporting one another, and thus maintaining proper alignment. He, also, riveted attention on the dangers resulting from their unskilful extraction, particularly those in the mandible. The pelican (he referred to it as the polican) was the instrument then in use: and he gave detailed guidance for its construction.

Allen criticised the prevailing practice of transplanting a human tooth from one mouth to another. Instead, he advocated the immediate insertion, into the alveolar socket, of the freshly extracted tooth of a dog, sheep, goat, or baboon. After having ligatured this to the adjoining tooth, he applied certain unspecified remedies of his own. He assured his readers that the tooth would then rapidly unite to both the gum and the jaw-bone. For scurvy of the gums, he recommended bleeding and purging, with the regular use of a mouth-wash, comprising mastic, myrrh and dragon's blood.

Allen styled himself, Operator for the Teeth, a term coming into fashion to distinguish the trained tooth-drawer from the market-place charlatan. The former was, generally, a member of the Guild of Barber-Surgeons, and had served an apprenticeship of from five to seven years, unless admitted on a patrimony basis.

The more respectable tooth-drawers devised their own instruments for both extracting and scraping the teeth: and commissioned a blacksmith to make them. In fact, many of them had their own forges, for instance, Rutter, one of the best known in the eighteenth century, and the last tooth-drawer to be Master of the Guild of Barber-Surgeons of England. The village blacksmith often practised dentistry as a sideline, because it was easy for him to make a set of instruments for his own use.

Itinerant tooth-drawers, on the other hand, frequently plied their trade in the market-places, being accompanied by a jester and a musician, whose duty was to render inaudible the victim's shrieks. Such practitioners, who were often adorned with necklaces and/or belts hung with teeth, proved to be popular subjects for caricaturists throughout the ages.

In the late seventeenth century, the construction of artificial dentures was no mean task. The use of beeswax for taking impressions did not come into vogue until, at least, a hundred years later. The operator for the teeth was, therefore, forced to measure a mouth carefully with compasses, and afterwards fashion a solid block of bone or ivory, until it roughly conformed to the desired outline. The final stages were executed alongside the patient by applying a pigment to the oral tissues, and fitting the denture over them. Each coloured part was gouged out with tools, such as gravers and files, until uniformity was attained.

It is interesting to realise that, even in Allen's time, certain of the more enlightened surgeons acknowledged tooth extraction as a speciality, to be undertaken only by an experienced tooth-

[1] Address delivered to The Scottish Society of The History of Medicine, January 25, 1950, the President, Dr. Douglas Guthrie, in the Chair.

drawer. For instance, in 1676, Richard Wiseman wrote : "When teeth are dislocated, or to be dislocated, a tooth-drawer is to be consulted."

There was a hiatus of 57 years until another English dental book appeared. Some information as to the state of dental practice during that period is, however, ascertainable from contemporary newspaper advertisements. For instance, there was a wide demand for powders and tinctures, guaranteed to cure, or prevent, toothache. This confirms the view that people would try almost anything, before submitting to the torture of having a tooth extracted by the somewhat villainous pelican, with its business end like a vulture's talon. Further, the numerous references to scurvy and loose teeth disclose that pyorrhœa was then rampant.

"A Practical Treatise upon Dentition; or, the Breeding of Teeth in Children," the second English dental book, was written, in 1742, by Joseph Hurlock, a London surgeon. He cited the number of infants, who died in England, from convulsions, teeth and smallpox, before attaining the age of two years. In 1739, they totalled 9,588. Hurlock offered valuable advice to mothers and nurses concerning the proper care of young children. He advocated lancing the gum, in order to ensure easier eruption of the teeth, and thus averting convulsions and unnecessary deaths.

Ten years later, Tolver, likewise a London surgeon, published "A Treatise on the Teeth." Therein, he declared that a proper regimen of living was the fundamental factor for ensuring healthy teeth. Also, that dental disease was due to internal, as well as external, causes.

He referred to the dangers attendant on the removal of tartar (or turf) from the teeth, also to the prevailing fashion of having them scraped by instruments, stressing the importance of entrusting such an operation to a skilful person. He warned the public to be chary of foreigners who treated the teeth. Doubtless, he was thinking of the very large influx of French practitioners, who were then practising, most successfully, in England.

In the eighteenth century, dental surgery was probably of lower status than any other branch of the healing art, and its practitioners had but little conception of professional ethics.

Berdmore and Hunter

An improvement in this latter respect, however, followed the appearance of Thomas Berdmore's and John Hunter's momentous works. The former was, undoubtedly, one of the most ethical dentists of his time. Born in 1740 (his father was a Church of England clergyman, and his brother, Samuel, later, a headmaster of Charterhouse), he became a member of the Surgeons' Company. His exact date of entry is uncertain, as records were not then accurately compiled, following the dissolution of partnership, in 1745, between the barbers and the surgeons.

Berdmore was apprenticed to Samuel Rutter and William Green, who were in business in Racquet Court, Fleet Street, London. Later (*circa* 1760), he was assumed a partner. Green was, in 1756, appointed Operator for the Teeth to His Majesty, George II, and, in 1760, to George III, but died in 1764, when he was succeeded by Berdmore. The last mentioned, persistently, described himself as a surgeon-dentist—a designation, which had come into use after Pierre Fauchard published his epoch-making work, in Paris, in 1728. It is a matter of considerable importance that, from the time Berdmore joined this firm, all newspaper advertising ceased although, previously, it had been extensive.

Berdmore, in 1768, when only 28 years of age, wrote "A Treatise on the Disorders and Deformities of the Teeth and Gums." This excellent book passed through several editions, and was translated into various languages. He condemned the use of the key by the unskilled, because not only were the tissues frequently torn, but also the adjoining teeth were loosened, and had, later, to be extracted. Further, he ridiculed the alleged virtues of the lodestone, charms, and incantations lauded by vagrant mountebanks and imposters.

He advocated lancing, in preference to the prevailing practice of giving a substance, such as coral, to chew, in order to relieve painful dentition. It appears to have been quite usual in his time for nurses, themselves, to incise the gums with their nails, or with a silver coin of the realm. He, also, advised close supervision of the primary dentition, particularly when their replacement by the secondary set was imminent. He explained that unduly prolonged retention of the primary teeth would, undoubtedly, cause irregularity in their successors. He uttered a stern warning against the ignorant and pernicious custom of attempting to regulate adults' teeth.

There is no doubt that Berdmore far eclipsed John Hunter in his knowledge of practical dentistry; this was phenomenal in such a youthful person. It was the outcome of a sound, lengthy training in dental mechanics, and extensive operative experience, all acquired with the busy firm of Rutter and Green, established in 1702 by John Watts. Not only did Thomas

Berdmore, in his short life of 45 years, contribute important theoretical and practical data to dentistry, but he, also, willingly instructed persons intending to practise it as a speciality.

Incidentally, although both Berdmore and Hunter held contemporary Royal Appointments, it does seem surprising that neither mentioned the other in his writings. The latter's book, "The Natural History of the Human Teeth," published in 1771, laid a solid foundation for scientific dentistry at a time when empiricism was rampant. Hunter's description of the formation and growth of the human teeth excelled anything previously written. In fact, he was without peer in this particular sphere. In "A Practical Treatise on the Diseases of the Teeth," published in 1778, there are, however, certain fallacies. When considering these, it must be realised that Hunter was, foremost, a surgeon, and not a practising dentist. At random, I shall cite two instances. It is somewhat astounding that, for pain in a tooth, without other symptoms, he advised burning the lobe of the ear with a hot iron. Also, a favourite operation of his was the transplantation of teeth. A few early successful cases would seem to have warped his judgment, otherwise so outstandingly sound. His advocacy of this highly objectionable operation failed, however, to influence dentists with a wider clinical knowledge to adopt the practice. A point, which is frequently overlooked, is that Hunter's 1771 and 1778 books were addressed mainly to dentists.

Reference ought here to be made to the fact that, in 1782, on the suggestion of John Hunter, William Rae, a dentist, delivered, in Hunter's house in Leicester Square, the first course of lectures on the teeth ever given in Britain. Further, it is interesting to recall that William was a son of James Rae, and a brother of John Rae, both prominent Edinburgh surgeons, who devoted special study to the diseases of the teeth. James delivered occasional lectures on dentistry, while John had an extensive dental practice, and was regarded as a very skilful extractor of teeth.

In 1799, Joseph Fox, at the age of 24, inaugurated a course of lectures on the teeth at Guy's Hospital. He, later, incorporated, and enlarged, these into two volumes, "The Natural History of the Human Teeth" and "The History and Treatment of the Diseases of the Teeth," published, respectively, in 1803 and 1806.

Being himself an experienced practising dentist, it is not surprising that his clinical dental knowledge eclipsed that of John Hunter, the surgeon. Consequently, his 1806 monograph is of greater value than Hunter's of 1778. In selected cases of dental irregularities in the mandible, Fox recommended the extraction of a right and left bicuspid, in order to relieve congestion in the incisor region. In certain circumstances, he advised, as a preventive measure, extraction of the four six-year-old molars, thus enabling the bicuspids, on eruption, to incline posteriorly, and obviate subsequent irregularity and caries. Further, he believed that a predisposing cause of caries of the teeth was some interference during the formative process.

The First Porcelain Teeth

With these brief remarks, we shall bid adieu to Hunter and Fox, and introduce a colourful personality in Nicolas Dubois de Chemant, who was a refugee from the French Revolution, and who made the first all-porcelain denture. Following litigation between him and his collaborator, Du Château—the latter accused the former of appropriating his invention—De Chemant was, in 1789, granted a French patent for manufacturing mineral incorrodible teeth. In 1791, about which year he arrived in London, he applied for, and obtained, an English patent. This entirely revolutionised the construction of artificial dentures. Instead of bone or ivory, he used mineral paste for both base and teeth, making them in one piece.

As De Chemant had, radically and rudely, upset the calculations, and incidentally the incomes, of those who practised dentistry, it is not surprising to learn that widespread envy was aroused, and abuse showered on him. Besides, he was not averse to making his discovery known to the public in widely circulated pamphlets, the first being "A Dissertation on Artificial Teeth in General," published in London, in 1797. Incidentally, he, therein, included letters of approbation from several well-known physicians and surgeons, and mentioned that it was customary for John Hunter to recommend patients to him. However, by 1814, De Chemant's invention was entirely superseded by individual porcelain teeth, introduced by Fonzi, an Italian, practising in Paris.

Although De Chemant zealously guarded his process, this was, nevertheless, in harmony with contemporary inventors. At that time, and for many years afterwards, there was not much friendly intercourse between practitioners: petty jealousies abounded. Dentists devised their own techniques, and used their own special instruments and materials. All these they guarded as religiously as if they had been state secrets!

In spite of the introduction of porcelain teeth, many dentists continued to use human teeth. Large sums of money were, willingly, paid to persons, who would permit their sound anterior teeth to be extracted, for use in the construction of artificial dentures for wealthy clients. "Resurrectionists" reaped a rich harvest from violating vaults, and extracting the front teeth from bodies therein. In fact, one such ghoul freely acknowledged that he could earn £20 from a single night's adventure! Further, hordes of depraved, mercenary persons were employed, chiefly by London dentists, to prowl the battle-fields, and raid the mouths of young soldiers.

The Nineteenth Century

As is to be expected, more rapid progress is discernible throughout the nineteenth century. Although there are many persons, to whom reference is due, nevertheless, their number must be rigidly restricted.

Let us consider Thomas Bell, who, in 1817, succeeded Joseph Fox as lecturer on the anatomy and diseases of the teeth at, and surgeon-dentist to, Guy's Hospital. His notable book, "The Anatomy, Physiology and Diseases of the Teeth," appeared in 1829. He deplored the barbarous quackery of extracting, at one visit, e.g. eight firm teeth from a child's mouth, aimed at promoting a regular secondary dentition. Bell condemned the indiscriminate use of a file to remove dental caries, because, by its means, a healthy area of a tooth was often damaged: and, consequently, would later disintegrate. In his book, he emphasised that both skill and judgment were necessary in the extraction of teeth, and issued a warning against relying solely on mechanical force.

In 1831, James Snell, who, seven years earlier, had written a book on artificial palates, published "A Practical Guide to Operations on the Teeth." Until the nineteenth century, it was a frequent practice, when extractions were to be undertaken, for practitioners to seat their patients on the floor. Although, around 1830, household armchairs were popular for this purpose, Snell realized their limitations. As a result he invented a dental chair, constructed on scientific principles. It was so planned that the patient could be placed in various positions; and there was an attachment (a kind of dumb-waiter) to hold the operator's instruments: and an adjustable footrest.

Snell, not untruthfully, stated that, throughout the ages, there had existed the greatest aversion to the extraction of teeth. He, justifiably, condemned a type of forceps then on sale for the perpendicular extraction of teeth. He, cynically, added that newly invented instruments remained popular for only so long as the patentees continued to advertise them. When this was discontinued they were soon forgotten and instrument-makers burdened with a stock of unsaleable articles.

Snell mentioned that a fee of one shilling was usually charged by medical practitioners for extracting a tooth: and that, not infrequently, they delegated this operation to their apprentices. Also, that in country districts, indigent persons were treated by the village barber or the blacksmith.

Reference will now be made to "A Practical Treatise on the Diseases of the Teeth," which was published in 1835 by William Robertson, a Birmingham dentist. This work was devoted mainly to the question of dental caries. He advised the daily use of the toothbrush: having the teeth inspected at least once a year by a dentist: and caries removed, in its early stages, by filing, or by excavation and subsequent filling.

In contra-distinction to several earlier and contemporary writers, Robertson, very wisely, emphasised that successful filling of teeth depended on the complete eradication of caries: and that, were this disregarded, disease would progress underneath the filling.

He uttered a stern warning against the use, in any circumstances, of acids to remove tartar from the teeth. As he wisely stated, any agents sufficiently powerful to destroy such an accumulation would, likewise, attack the structure of the tooth. He asserted that, in every case of apical abscess, the infected tooth should, immediately, be extracted. He condemned those practitioners who treated this by applying heat until the inflammation had subsided, and then extracted the tooth. His views were very enlightened. In fact, Robertson's book is one of the landmarks in the theory and practice of dental surgery.

And now we come to Alexander and Robert Nasmyth, who considerably advanced the cause of scientific dentistry. Alexander (trained by Robert) was the elder, and his outstanding work, "Researches on the Development, Structure and Diseases of the Teeth," was published in 1839. He, also, carried out extensive research on the histology of the teeth; and reported his findings in a Paper, which he read to the Medico-Chirurgical Society in the same year as his book was published. His name is perpetuated in "Nasmyth's Membrane," the enamel cuticle, which he accurately described.

In spite of several efforts to improve it, the status of dentistry in Britain remained humble

and chaotic. However, a stalwart, in the person of George Waite, with the spirit of a crusader, entered the arena, with the avowed purpose of rectifying this state of affairs. In 1841, he issued a pamphlet entitled "An Appeal to Parliament, the Medical Profession and the Public on the Present State of Dental Surgery." In this, he offered practical suggestions for eradicating existing evils, safeguarding the public and ensuring a higher uniform standard of practice.

Waite cited the anomaly of any illiterate, untrained, unprincipled impostor practising dentistry: and drew attention to the frequently dire effects of such unskilled treatment. He, also, advocated the introduction of a code of laws to govern the practice of dentistry, and a scale of fees. Should Parliament decline to undertake this duty, he advised all ethical practitioners to establish a centre for lectures and training: and award certificates of fitness to practise. Further, he visualised such a society being, at a future date, granted a Royal Charter.

Fundamentally, Waite stressed that Parliament, in any legislation, should ensure that dentistry be carefully defined as a branch of surgery, under the control of the Royal College of Surgeons of England. His efforts, nevertheless, proved unsuccessful, probably because only 12 of the 200 dentists, then practising in London, were members of the Royal College of Surgeons.

Two years later, a private meeting was convened by several prominent dentists. Their aim was to have the control of dental surgery included in Sir James Graham's Bill for the more efficient regulation of the Medical Colleges. To further this project, it was resolved that two of their number should interview the President of the Royal College of Surgeons of England. The response was, however, unsympathetic, the President expressing the opinion that those members of the College, who practised dentistry exclusively, were, strictly speaking, seceders. Consequently, the comprehensive training of the dentist remained unsolved; in fact, efforts to attain this seemed almost akin to rainbow-chasing.

Instruction in the mechanical branch was much more easily acquired, because practising dentists were ever eager to accept apprentices at very high premiums. Further, if adequately remunerated, they were prepared to permit their protégés to practise extractions and fillings on the poor, whom they treated gratis, usually between the hours of 8 and 9 o'clock each morning. In this connection, an interesting sidelight is afforded in Joseph Snape's Reminiscences. In 1830 before embarking on practice on his own behalf, he decided to have one day's instruction in gold fillings from a dentist, who excelled in this branch. The fee exacted was £50.

British Journals

Disregarding, for the time being, the unpleasant disputes that persisted between rival groups of dentists concerning reform, it is interesting to note that the first dental journal in this country, *The British Quarterly Journal of Dental Surgery*, was published on March 30, 1843. Its purpose was to record the latest reliable discoveries and inventions: and, by making these freely known to the profession, raise its status. The editor was James Robinson, an enlightened and competent practising dentist. Although the ideals were excellent, unfortunately, publication ceased with the second issue, namely that of June 30, 1843.

In spite of keen disappointment, Robinson was undaunted. Consequently, on January 13, 1844, he launched a fortnightly journal, *The Forceps*, which embraced dental surgery and the collateral arts and sciences. This somewhat lively, but unlucky, journal lapsed with the issue of March 8, 1845.

Incidentally, it is interesting to mention that, within three weeks of J. Y. Simpson's use of chloroform in midwifery, Francis Brodie Imlach, a Licentiate of the Royal College of Surgeons of Edinburgh, and a practising dentist, was the first person to extract a tooth under its influence. In fact, within a year, and without even one fatality, Imlach had administered chloroform in over 300 dental cases.

It was not, however, until 1856 that sound progress was made in stabilising the dental profession. Samuel Rymer, an ardent reformer, then urged the inauguration of an independent college of dental surgery. This resulted in the convening of a meeting of 200 dentists, at which resolutions were passed, vigorously approving the founding of a dental society, and establishing a system of professional education and examinations. As an outcome, the College of Dentists was started in 1856, with 150 members, and James Robinson as the first president.

In the same year, a rival body of dentists, likewise anxious for reform, organised the Odontological Society of London, with Samuel Cartwright as the first president. Its fundamental purpose was to persuade the Royal College of Surgeons of England to grant a dental diploma. In this connection, one of the notable figures was John Tomes, a pioneer in dental reform. Besides being surgeon-dentist

to the Middlesex Hospital, he had, in 1848, published "A Course of Lectures on Dental Physiology and Surgery," which he had, earlier, delivered there.

Also, in 1856, Walter Blundell launched *The British Journal of Dental Science*, which espoused the cause of the College of Dentists. However, before the close of that year, he offered to sell it to this body, but it was declined. It, finally, became the official organ of the Odontological Society of London.

In 1857, the College of Dentists, nevertheless, started its own periodical, *The Quarterly Journal of Dental Science*, under the editorship of James Robinson. This College, shortly afterwards, instituted a course of lectures on medicine, surgery and dentistry: and granted certificates of fitness to practise. The underlying aim of the College of Dentists was that it should be to dentistry, what the Royal College of Surgeons of England was to surgery.

Early Legislation

Consequently, there existed two societies, which aimed at raising the status of dentistry, but which differed, fundamentally, as to the means whereby this should be achieved.

It was, however, due to representations by the Odontological Society of London that a clause was inserted in the Medical Practitioners' Bill, empowering the Royal College of Surgeons of England to institute examinations for, and grant the diploma of, Licentiate in Dental Surgery. This became law on July 6, 1858, and the first examination was held in March 1860.

The pioneer dental hospital and school was due to the efforts of the Odontological Society of London, opened on November 1, 1858, at 32, Soho Square. It was then known as the Dental Hospital of London.

The College of Dentists, on November 5, 1859, opened another dental hospital at 5, Cavendish Square, and named it the Metropolitan School of Dental Science.

Fortunately, in 1863, the two dental societies (The College of Dentists and The Odontological Society of London) decided to amalgamate under the title of The Odontological Society of Great Britain.

Progress was not, however, confined to London. In May 1856, John Smith had delivered, in the Royal College of Surgeons of Edinburgh, the first comprehensive course of lectures on dental surgery in Scotland. Further, he, along with Robert Nasmyth and others, had, in 1860, been instrumental in founding the Edinburgh Dental Dispensary, later to become the Edinburgh Dental Hospital and School.

It is interesting to recall that, in 1862, William Williamson was the first dental surgeon in Scotland to be appointed to a medical school and hospital, namely Aberdeen Royal Infirmary; the second appointment was that of John Smith to Edinburgh Royal Infirmary in 1863.

Doubtless, due to the 400 miles which separated London from Edinburgh and Glasgow, it was believed, by many Scotsmen, that the formation of a dental society in the North, on lines similar to the Odontological Society of Great Britain, would further the cause of dentistry in Scotland. In consequence the Odonto-Chirurgical Society of Scotland was founded in March 1867.

Incidentally, in 1865, there were only 280 licentiates in dental surgery, of whom 136 practised in London, and the remainder were scattered throughout the rest of England, Scotland and Ireland.

Justifiable discontent still prevailed. The more cultured and better educated dental practitioners realised that, in spite of a dental diploma and professional societies, the objective had not yet been attained. The vast majority of those who practised dentistry declined to submit themselves to examination. They were conducting lucrative practices, and realised that the possession of a diploma, with its consequent ethical enforcements, would curb their activities, particularly alluring advertising.

In January 1876, there was founded The Association of Surgeons Practising Dentistry, membership of which was rigidly restricted to Fellows and Members of the Royal College of Surgeons of England. Two months later, another body, the Dental Reform Movement, was started. Samuel Cartwright was one of the most outstanding members of both societies, and, at all times, unstinting in his efforts to advance the cause of his profession. In 1877, he had the unique and, well deserved, honour of being, at the same time, president of the two newly created societies, as well as of the Odontological Society of Great Britain.

It must, in justice, be conceded that it was due mainly to the untiring efforts of the members of the Dental Reform Movement that The Dentists Act, 1878 came into force in July of that year, enacting that the practice of dentistry in this country be under the ægis of the General Medical Council.

Briefly, its main provision was to establish a Register of persons entitled to practise dentistry. In consequence, there was an unprecedented rush by all and sundry (many bogus) to have their names enrolled within the prescribed period. For instance, in January 1878, there

were approximately 2,200 dentists practising in Great Britain; six months later, there were 5,289 registered dentists! Penalties were to be imposed on any unregistered person, thereafter, making use of the titles, Dentist and Dental Practitioner.

This new legislation did not, of course, rescind the right of persons on the Medical Register to practise dentistry.

Further, all the medical authorities, which then granted surgical qualifications, were empowered to institute examinations for and award dental diplomas.

This Act seemed excellent *in print*. Although, as an outcome, the status of dentistry was undoubtedly raised, particularly in public esteem, there were many defects, so I shall conclude this Paper, with these possibly appropriate lines:

"*We* think our fathers fools, so wise *we* grow.
Our wiser sons, no doubt, will think *us* so."

MEDICAL AND DENTAL EDUCATION IN GREECE AND ITALY[1]

ECONOMICALLY poor, politically unstable and only rarely possessing an efficient government, Greece has lacked the opportunity to establish the academic and professional traditions which, in other countries with a greater degree of stability over a longer period of time, have played an important part in the development of medical teaching and, as in the case of Vienna, have enabled medical education to survive, more or less unscathed, temporary periods of national unrest.

The University of Athens was founded in 1837 but the medical school has existed for a much shorter time. During the German occupation a second medical school was founded at Salonika where there is also a military school of medicine. The students at the military school take the university courses and one additional year of military medicine. They possess the advantage that their living quarters and food are all paid for and, even more important, they are supplied with books. After the completion of their studies, they are bound to serve for twenty years in the army.

The universities being government institutions, in the past changes of government have resulted in the replacement of valuable men by others of different political affinities. Nepotism and social connections also influence the staffing of the medical faculty and this has penalised to an unfortunate degree many able individuals who have no such connections. The annual rotation of the dean's appointment, a system which is common in European schools, tends to prevent the initiation of a strong continuous administrative programme.

The situation in Greece during the last few years since the Italian invasion and German occupation has been disastrous from the point of view of normal academic function. Under political pressure many times too many students crowd the inadequate buildings of the medical schools and wards of the hospitals, especially in Athens, where before the war there were 900 students, whereas now there are several thousands. Furthermore, it is difficult to expel students who fail examinations. There are cases of students failing one examination as many as fourteen times. The number of students receiving medical education is quite out of proportion to the needs of the country and many graduates will not be able to find a remunerative practice.

Due in part to the monetary inflation, the salaries of the teaching staffs of the medical schools are inadequate and many teachers of the pre-clinical sciences are forced to supplement their incomes by undertaking outside work, sometimes of a non-medical nature. The clinical professors are in a better position since they are permitted to engage in private practice.

There is a general neglect of the pre-clinical sciences. The pre-clinical departments tend to be inadequately staffed and financed and it is only by giving carefully chosen men the opportunity to reorganise these departments and providing the necessary funds that the standard of medical education in Greece can be raised. In Athens, however, the Anatomy Department, although much of its space is occupied by the army, is an active one, and anatomy is one of the few subjects where the teaching is not entirely didactic.

Physical equipment, books and laboratory and research facilities, are sadly deficient, to some extent due to looting by Germans and destruction by Communists.

Students commence the medical course, which occupies six years, at the age of 17 to 18. The first year is devoted to chemistry, physics, biology and osteology; the second year to pharmacology, pathology and bacteriology. The last three years are spent in hospital medical and surgical practice.

Although there are notable exceptions the attitude of the staff towards the students is one of aloofness and teaching is to a large extent didactic; the free

[1] Abstracted from a Report by Paul D. White, M.D., Chairman of the Medical Mission to Greece and Italy of the Unitarian Service Committee, Inc., 31, Union Square West, New York, 3.

expression of ideas by the younger men is not encouraged. Owing to the very large numbers of students, bedside instruction is difficult to carry out and teaching in medical and surgical subjects to a large extent takes the form of lectures and demonstrations.

The Greek hospitals vary in their equipment and efficiency. All are overcrowded and most are poorly equipped. The large public hospitals, in which are situated the university teaching clinics, are rather worse off than the private hospitals. In spite of these difficulties the staffs are on the whole doing satisfactory work. Although there are many examples of inefficient poorly equipped hospitals where only the most primitive care of the sick is provided, there are a few examples of very good devoted work being done under gravely adverse conditions. For instance, in Athens, the wife of one of the professors has established children's surgical wards in the Hippocratian Hospital and in the Polyclinic, and personally endeavours to supply the children with adequate and suitable diets. Perhaps the greatest lack of all in Greek hospitals is that of trained nurses but steps are being taken to improve the situation in this respect.

Psychotherapy is not generally available and personnel trained in dietetics and physiotherapy are rare. Nevertheless in Athens some careful nutritional studies have been carried out and for this sort of study plenty of material was available during the period when malnutrition was very common.

Many essential medicines are unavailable and some are in short supply or obtainable only on the black market. Many medicines are used without a full appreciation of their action and there is a tendency to prefer injection to administration by mouth.

Hospital records and follow-up systems are for the most part poorly kept. This is partly due to a lack of secretarial and technical assistance but is in part due to a lack of critical training of the physicians.

Years of fighting in the Balkans, culminating in the catastrophic results of the German occupation and subsequent complete dislocation of the economy of the State brought about by guerilla warfare, have resulted in a certain amount of apathy towards human suffering. This is reflected in the attitude of doctors in Greece.

Some brilliant, well-trained physicians stand out clearly and there are many good clinicians, especially diagnosticians. As a rule these are men who were fortunate enough to obtain part of their training abroad, but this is no longer possible. The surgical talent found in private hospitals is in many cases better than that in the university. Technically many Greek surgeons are extraordinarily clever and the standard of abdominal surgery is high. They are handicapped by a lack of facilities for general anæsthesia which completely prevents the undertaking of thoracic surgery. There are no trained anæsthetists in Greece and surgeons for the most part employ local or regional anæsthesia, at which they are very adept. When general anæsthesia is used it is usually open drop ether or intravenous pentothal administered indifferently by nurses, orderlies or surgical assistants. Blood transfusion is rarely used and blood banks have not been established because the Greek civilian is apparently loath to donate blood.

Tuberculosis in all its forms presents a large problem in Greece today and is impossible to control until economic and social improvements are attained. Food is now more plentiful throughout Greece and in consequence cases of malnutrition are less common. Sanitation, however, is still very poor and in consequence dysentery, echinococcus infection and diphtheria are commonly met with. Many physicians are aware of the need for better control of sanitation, nutritional requirements and of infectious disease, and with the aid of D.D.T. already a remarkable reduction has been made in the number of cases of malaria, which has always been a major medical problem in Greece.

Cases of rabies from dog-bites are not uncommon. It is considered that the infection is derived from wolves which are still numerous in the mountainous frontier regions. It is estimated that there are between one and two thousand lepers in Greece.

Dentistry in Greece

Greece's one dental school, situated in Athens, was closed from 1940 to 1943, and suffered considerable destruction in 1944. Its equipment is obsolete and insufficient. There are no electric engines, no units or even spittoons.

Before the war the annual entry was 50 students but today 1,800 students are enrolled, about half of them women. In order to accommodate this great influx of students they work at the chairside in shifts of as little as two hours per week. Each student is required to complete 4 dentures, 10 gold inlays, 30 amalgam fillings and 30 silicate fillings. The pre-clinical teaching, which is perfunctory, is taught at the university.

The school has part-time professors in Prosthetics, Dental Surgery, Orthodontics and Operative Dental Surgery. Facilities for research are poor and there is no possibility of studying for higher degrees.

Little can be done to make the dental teaching adequate unless the number of students is curtailed. There are about 2,000 dentists for a population of 6 million people so that, bearing in mind the small demand for dentistry among the population, there appears to be no very urgent necessity to increase

the number of dentists rapidly. There is an urgent need for essential equipment and the teaching staff would have to be supplemented, preferably by young men who have had additional training abroad.

Outside the dental school there are a number of well-qualified dentists, many of whom have been trained abroad, in the U.S.A., France and Germany, and some have had a combined medical and dental training.

One disappointing feature of Greek dentistry is the lack of co-operation. This is exemplified by the fact that in Athens alone there are five different dental societies and also by the fact that, although there are a number of people investigating dental fluorosis in the town of Lavion, they are all doing so independently.

In Salonika there are a number of industrial dental clinics but little more than emergency treatment is carried out.

It is clear that there is less caries in Greece than in central and northern Europe. In the fluorosis area of Lavion, nearly all the children have a full complement of teeth with very little caries. On the other hand in some poverty-stricken villages gross decay of the deciduous dentition was encountered among the children who seemed to be underdeveloped.

The effect of wartime and post-war conditions upon the teeth of the Greek population is difficult to assess owing to the absence of caries incidence figures for the pre-war years.

Greece appears to offer unique opportunities for caries surveys, nutritional studies and studies of water supply in connection with the problem of dental caries.

Italy

The medical situation in Italy is much better than in Greece. Italy suffered less from the burden imposed by war and, unlike Greece, has since had several years of peace so that greater strides have been made in the process of recovery. In addition sound medical traditions have existed in Italy for centuries.

As in Greece the most notable feature of the medical schools is the gross overcrowding with students, which places an intolerable burden upon the teachers. In Rome, for example, it is said that there are nearly 6,000 medical students whereas there is adequate provision for only about one-fifth this number. In consequence laboratory work is seriously curtailed, there is too little bedside teaching and teaching generally has to be didactic and takes the form mainly of lectures. Those responsible for the organisation of medical teaching are cognisant of the importance of reducing the number of students to reasonable proportions but can do little about it as it has a political basis originating in the Fascist laws which made entrance to the medical schools easy for the "average man".

In general the professors and their staffs are able, energetic and well qualified, but still handicapped by old continental traditions that prevent satisfactory co-operation between various departments and clinics and establish a great gulf between the professor and his students.

As in Greece the salaries of the medical staffs are very low. Where the pre-clinical teachers are not men of independent means, it is impossible for them to maintain themselves solely on university salaries, which reacts to the detriment of their work. The clinical teachers, on the other hand, are financially independent because of their large private practices.

There is generally speaking a failure to recognise the importance of the basic pre-clinical sciences and of the laboratory in the practice of medicine. For instance, both biochemistry and bacteriology are optional subjects and only 25 per cent to 40 per cent of the medical students take these courses. In anatomy the situation is made worse by an insufficient supply of cadavers. On the other hand, the students see plenty of autopsies which are compulsory in Italy.

The medical staffs are eager to do research but there is increasing difficulty in obtaining funds for this purpose. Nevertheless some valuable research is being carried out, particularly at the Forlanini Institute, a very handsome tuberculosis sanatorium in Rome. There has been a regrettable neglect by the English-speaking world of recent Italian contributions to medical science.

Most hospitals in Italy are fairly well equipped and, although by no means adequate, the nursing staffs are better trained than in Greece. The Catholic nursing sisters are gradually being replaced by ordinary trained nurses.

Ignorance of the advantages of medical care and fear of doctors and hospitals are widespread and deprive many people, especially children, of the facilities available.

The standard of surgery in Italy is high and in Rome, where trained anæsthetists are available, thoracic surgery is undertaken, but there is little tendency for specialisation in surgery. Except in Rome most surgery is done under local anæsthesia, but in general there appears to be some lack of regard for the importance of the relief of pain. For instance, in Italy, and in Greece also, tonsillectomy is performed in young children without anæsthesia and anæsthesia for childbirth is rare. On the other hand the technique of fluid and blood therapy as adjuncts to surgery is well advanced.

Health conditions in Italy are reasonably satisfactory, especially in comparison with the conditions that existed three or four years ago. Except in

Naples, where hygiene and nutrition is very poor indeed, there is now little evidence of malnutrition and the only outstanding health problem is tuberculosis, the incidence of which is on the decline. Nevertheless there are many cases of tuberculous meningitis for which streptomycin is being used with some success.

Sanitation still leaves much to be desired. Efficient sanitation only exists in the homes of the wealthy, the luxury hotels and in some hospitals. Nevertheless malaria seems to have been successfully attacked and the incidence of diphtheria has been reduced by compulsory immunisation.

Dentistry in Italy

In Italy dentistry is taught as a two years' extension course after six years of medical training. Thus all qualified dentists are medically qualified as well. In theory this is a fine system which should result in a high professional standard. Unfortunately, however, there is a very large number of dental practitioners with neither medical nor dental training. Some of these are associated with the practices of doctors. Furthermore, a physician may practise dentistry without of necessity having attended a course in dentistry.

It is estimated that 10 per cent of undergraduates in the medical schools plan to practise dentistry. Those who do attend the two-year dental course, which is offered by several universities, suffer from a lack of tuition and the facilities for specialised dental education.

The first measure to be taken to make the dental profession in Italy of a more uniform quality is legislation to prevent technicians and unqualified physicians from practising dentistry.

In contrast to the group which practises dentistry with inadequate training there are to be met with many eminent dentists with a very broad education and a sincere interest in and profound knowledge of dental problems. For instance, the papers read at the International Congress of Stomatology held in Rome in 1948 were of a high standard.

The Eastman Dental Dispensary in Rome is without doubt the best equipped and most outstanding institution in Italy. It is, however, no longer limited to work on children. Much of the space is now used for orthodontic and parodontal work, prosthesis and maxillo-facial surgery.

In contrast the university clinic, the Clinica Odontoiatrica, where doctors are trained for dental practice, is very poorly equipped.

The school in Bologna is better staffed and equipped and has the greatest number of students of all the dental schools. The school in Florence was destroyed during the war and has been rebuilt but still lacks essential equipment such as library facilities.

There are at least two regions of dental fluorosis in Italy and the subject of fluorine in the prevention of caries has aroused interest. In Rome a large-scale study of the effect of topical application of fluorine is being undertaken. The results seem to indicate that this method is not so effective as American reports suggest.

ACCELERATED ACRYLIC MATERIALS: A PRELIMINARY REVIEW

By ROBERT CUTLER, L.R.C.P.Lond., M.R.C.S., L.D.S.Eng.

Ever since the practical consequences of the polymerisation of methyl methacrylate were fully understood, so that routine methods could be elaborated for dental use, interest has been maintained in the study of additives to the powder liquid mix whereby acceleration of the polymerisation reaction could be secured without material detriment to the finished product. This latter qualification is important, since the polymerisation reaction is itself exothermic, and any acceleration brought about by new physical or chemical aids, might well cause a reappearance of troubles, such as porosity, or difficulty in manipulation, which had been largely, or completely, overcome by gradual improvement in the traditional techniques. Persistent interest in means whereby polymerisation could be spontaneously accelerated was of course natural, as any major reduction in the accepted time necessary for full polymerisation would in itself be valuable, whilst if, in addition, it proved possible to avoid the application of any major degree of heat, other advantages of different character, but no less importance, would also accrue.

Although polymerisation of the liquid monomer can in certain circumstances occur spontaneously, normal methods of processing comprise a carefully watched heat and pressure control, in which chemical accelerators play no part. From the beginning, however, Leader and others have shown that oxidisers, such as benzoyl peroxide, have an accelerating effect, and, in certain preparations, this type of additive has already been used with advantage. It had been known that this aspect was being further studied abroad, and in the report of the British Intelligence Objectives Sub-Committee [1], made available to those interested after the late war, it was disclosed that a further additive in the nature of a tertiary amine, produced an even

further increase in the rate of polymerisation, and that if a suitable technique was elaborated, good use might be made of such a material. Before so doing, certain primary investigations had to be undertaken to determine whether such additives were (i) to the detriment of the finished product, (ii) without deleterious effect on the mouth tissues, and (iii) without extraneous side effects, causing undue elaboration of manipulative technique. These investigations have progressed to a point where a product (Simplex Pentacryl) has now been made available in this country, comparable to materials obtainable abroad, and it is the purpose of this introductory review to assess, very generally, the possibilities and limitations of this type of material from the standpoint of the practical dentist.

At the outset, it should be realised that in spite of the apparently magical—no other word is really adequate—property of self-curing at room temperature in a space of ten minutes, the phenomenon is a true polymerisation reaction, and if mechanical principles of preparation, manipulation, and subsequent pressure control are not observed, an inferior or faulty product will inevitably result. It should therefore be employed against a background of the fullest knowledge of traditional processing techniques. In due course, full investigation of the physical properties of this new material should provide results of interest, but from the standpoint of the practising dentist its suitability for certain procedures is so obvious that there is every encouragement for its clinical use. The author's experience covers rather more than one year to date and during this period the closest attention was naturally given to the possibility of disadvantages, to which specific reference has already been made, to wit (i) any detriment in the finished product ; for all the purposes to be later specified the material has proved entirely stable, and not readily distinguishable from standard acrylic products, so that no particular difficulties have been experienced, or are envisaged, on this score. (ii) Deleterious effect on the mouth tissues ; in view of the activity of the constituent additives, this aspect was naturally treated with great reserve, particularly as direct application of the fresh mix to the tissues, is an essential step in certain very useful direct procedures, and although in the author's experience no single case of tissue sensitisation has been noted, cases have been described where vesicular eruptions, or "burns," have undoubtedly been caused. The author's lack of trouble in this connection over a large series of cases is possibly significant in that unduly liquid "mixes" are never employed by him, and in the large number of direct applications made, he has utilised a "mix" as near the dough point as practicable. It would seem, therefore, that adherence to this principle, which for other reasons is equally desirable, confers a measure of safety not to be lightly disregarded. (iii) Extraneous side effects causing difficulty in technique ; no particular troubles have been experienced on this score, once the necessary speed and deftness in manipulation of the material had been achieved, but the very simplicity of the technique is, in itself, a real danger, as there may be a constant temptation to neglect the cardinal principles of preparation and pressure control, with detriment to the product, and disappointment to all concerned. If the conception of a virtually "self-curing" acrylic can be fully comprehended—and it is a little difficult to do so against a fifteen-year background of boiling the material, whether in an old saucepan, or the latest automatic time-controlled electric cooker—certain usages become immediately apparent, many of which are now incorporated in the author's day-to-day routine work. Amongst such usages, the following can be brought to mind : (1) Immediate and permanent replacement of fractured or displaced teeth. (2) Immediate additions. (3) Immediate repair of fractures or breakages. (4) Partial or complete relining. (5) Immediate additions to, or modifications of, removable regulation appliances. (6) Immediate construction of the so-called "temporary" partial denture. (7) Immediate construction of base plates, or special trays. The term "immediate" is of course used in a relative sense, and not for instance in the sense that arc welding immediately joins two pieces of metal, but in so far as repairs or additions by the direct method can be completed in fifteen minutes, and for cases needing indirect methods, i.e. plaster model and counter, in an hour, the comparison with traditional method is sufficient to justify the term in a general way.

It follows logically that this material, suitably modified as to colour and consistency, could be employed for conservative procedures by direct application, and the author has completed not a little clinical work in this field, but caution is desirable, and careful selection of cases and adequate follow-up are essential, so that no further reference to this admittedly intriguing application is made in the present review.

Manipulation and Behaviour of the Material

The powder and liquid are not obviously different in appearance from standard materials,

though the liquid has a most penetrating and pungent smell and taste ; it is, however, noteworthy that once the material has hardened, i.e. polymerised, both taste and smell disappear completely. The " feel " of the material when ground, or filed, is similar to that of standard products, though if a fragment is burnt in a flame, the odour is slightly different, being somewhat similar to the smell of the monomer to which attention has been drawn. Mixing is effected either on a cool slab in the same way that a cement is mixed, or in a dappen glass, or comparable vessel, speed and deftness being essential, otherwise the mixture passes into a rubbery and unmanageable mass. Within limits, the more liquid the mix, the slower the set, but undue liquidity is in every sense undesirable, for the specific reasons stated above, so that the more " body " in the mass, the better, provided it is compatible with the user's working time. As regards actual step-by-step descriptions of technique, the maker's instructions will naturally be followed, a close and detailed study of the directions issued by Continental and American Manufacturers showing no significant dissimilarity.

Making due allowance for the makers' partisan enthusiasm, the claims made can, in the main, be regarded as reasonable, and easily capable of substantiation, though a warning as to the possibility of tissue sensitisation in direct application techniques seems advisable.

One outstanding, and indeed infinitely encouraging, characteristic of the material, is the quite phenomenal affinity of the mix for the parent material, for which the simplest of tests will suffice. This consists in taking any old plastic denture, cleaning it mechanically by polishing, and then, as directed, painting the selected surface, say the vault of the palate, with the monomer which is allowed to evaporate. A lump of the mixed material is then pressed on the selected surface with the thumb, pressure being maintained for three or four minutes, the case being then left on the bench for ten or fifteen minutes, or immersed in tepid water for half this time. The added mass can then be cut, ground and polished immediately, and becomes virtually indistinguishable from the parent material, either at the junction line, or in cross section. This affinity may be an actual embarrassment, and due care must be taken to see that unwanted excess does not adhere to other parts of the denture being handled, as its removal by means other than grinding may be impossible. Against this background, steps in formulation of technique for repairs, and additions, follow automatically, and although direct relining (particularly partial relining to compensate for local absorption in " immediate insertion " dentures) and direct replacement of displaced, or broken teeth by hand pressure, provide ideal applications, mechanical principles must never be disregarded, and all but simple repairs should be flasked, or have a plaster model and counter made, pressure on the latter being exercised by any available screw clamp For direct applications, the author's technique is to exert pressure, or to have the patient exert occluding pressure, for not less than three minutes, after which the denture is left in tepid water for not less than seven minutes, grinding and polishing following immediately.

Flasked cases should have the plaster warmed prior to packing and pressing, but, in general, a curing time of twenty minutes can be regarded as erring on the side of safety.

Although a direct total relining of a full lower denture can safely be handled with great satisfaction, caution should be exercised with full upper dentures, as, if the mass is made liquid to allow sufficient working time for spreading, prior to insertion and closure by the patient, tissue irritation or " burning " may conceivably occur, whilst if the mix is made stiffer it may become unmanageable, and its more or less complete fusion with the palatal surface, should application have started, may completely ruin the denture, in the sense that it will all have to be ground away, obliterating the seating landmarks on which any successful relining depends.

For base plate or special tray work, the material can be finger moulded, and left to harden, though it should be realised that the resultant fabrication, whilst perfectly adequate for its purpose, is in no sense a hard dense product comparable to similar material polymerised under adequate pressure. In certain respects, the very speed of the polymerisation process makes " follow up " of contraction by continued pressure, more easy, as in the slower materials, local hardening may obstruct the efficient application of the " follow up " pressure on the main mass [2]. Actual working contraction, as distinct from theoretical net contraction figures, should therefore show up well with the new materials, these being confirmed in tests with the author's standard circular die assembly, described in previous papers.

As time passes, experience will accrue with the continued use of this group of materials, and its scientific interest and practical applicability seem so outstanding, that time is unlikely to be lost in exploring its potentiality ; not the

least is the gratitude of patients for apparently miraculous help at crisis times, and this alone should be a very real incentive for study, which should be second nature to the practitioner worthy of his craft.

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[1] Recent German Developments in the Field of Dental Resins. Report prepared by Field Information Agency, Technical U.S. group Control Council for Germany. Final Report 1185; British Intelligence Objectives Sub -Committee London, H.M. Stationery Office.

[2] CUTLER, R. (1944) *Brit. dent. J.*, 77, 1.

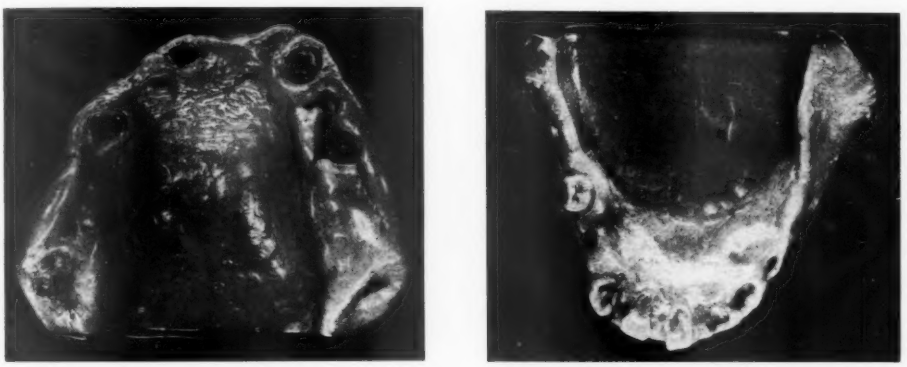
SHORT COMMUNICATIONS

CHRONIC HYPERPLASIA OF THE GUMS

By E. K. TRATMAN, *O.B.E.*, M.D.S., F.D.S. R.C.S.Eng., F.S.A.

Case No. 846/48. *Chinese* (Hokien), female, aged 28.

The patient attended in the first place with a complaint of pain for one week vaguely referred to the molar region of the left side of the maxilla. The patient did not consider that there was anything abnormal in her oral condition. Figs. 1 and 2 show the condition found.



A B

Fig. 1 (A and B).—Acrylic models of condition found. (¾ actual size.)

Fig. 2.—Occlusion of hyperplastic maxillary gums with mandibular arch. Acrylic model. (¾ actual size.)

On the left side was a firm, smooth mass of dense fibrous tissue projecting downwards as seen in the figures. It was quite painless and had the colour of the normal gum into which it merged imperceptibly. In the distal aspect was embedded a root fragment of the third molar while more anteriorly the roots of $\underline{|2345}$ were present. $\underline{|45}$ were partially concealed by the gum tissue while the apex of $\underline{|3}$ had become necrotic and had ulcerated through the labial wall of the alveolus (fig. 2) and was the site of a small abscess, the immediate cause of the pain. The root of $\underline{1|}$ was present, though, in the anterior region in general, there was no marked thickening of the soft tissues, except for a slight thickening in the palate anteriorly. On the right side there was thickening slightly in evidence round the $\underline{4|}$ root and, posterior to this, there was a mass similar to the left side with the roots of $\underline{8|}$ present. These maxillary masses of tissue occluded with the mandibular arches (fig. 2). Digital examination of the tissue masses suggested that they were entirely soft tissues and were not bony.

On the left side of the mandible there was virtually no alveolar ridge in the premolar-molar area but in the region of $\overline{|78}$ there was a thin ridge of soft tissues on the top of the bone. This ridge was folded over to the lingual by occlusion with the maxillary tissue (fig. 1 (B)).

Anteriorly there was a marked forward slope of the mandible with what almost amounted to a " simian shelf," which did not in any way interfere with the patient's ability to speak, indeed she was rather a voluble patient. The remaining anterior teeth were fanned forward and spaced. On the right side there was a minor degree of hypertrophy of the gum present round the first premolar

and slight evidence of pre-existing hypertrophy posterior to this.

The arches were large, well formed and there was an inferior protrusion, which is quite commonly found in Chinese. Neither the size of the arches nor the alveolar prognathism are out of the ordinary. There was no indication of acromegaly or of any other abnormal condition being present.

The patient failed to attend after the preliminary extractions of the roots in the maxilla had been done, so further investigations were not possible.

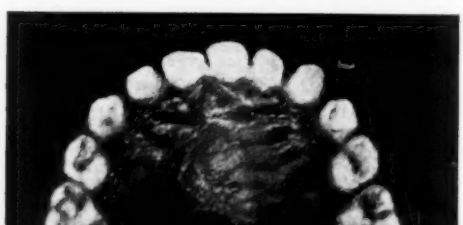
As in other cases the cause of the hyperplasia is obscure. A study of the mandibular condition suggests that there had been a similar condition present, but that it had undergone reduction following the loss of the posterior teeth. The inferior protrusion may be a result of closure of the bite following on such loss. In the maxilla, the worst areas were associated with chronic sepsis, but it is not possible to state which came first, the sepsis or the hyperplasia. Chronic hyperplasia of the gums associated with very low-grade chronic marginal gingivitis, and shallow pocket formation, and commencing in the molar regions is seen quite frequently in Indian patients but much less commonly in Chinese. It would seem that in this variety, sepsis is a factor in the development of the condition.

UNILATERAL DUPLICATION OF THE MAXILLARY DECIDUOUS CANINE

By F. A. C. OEHLERS, L.D.S.Singapore

The patient, a boy aged 5 years, had a supernumerary tooth in the left maxilla which, in every way, resembled a deciduous canine. It was impossible to distinguish the normal from the supernumerary canine. Both were in line with the other teeth in the arch, but the more anterior of the two was rotated disto-labially by about 90 degrees. The presence of the supernumerary tooth had caused ⌊ab to be displaced slightly mesially.

Radiographs show that the deciduous canine of the opposite side was not similarly duplicated, nor were the permanent canines of either side.



Palatal view of acrylic model of case.

The occurrence of supernumerary canines in either the deciduous or permanent dentition is an extreme rarity. A case of symmetrical duplication of the maxillary deciduous and permanent canines is quoted by Colyer,[1] and another of symmetrical duplication of the maxillary permanent canines[2] has been reported.

[1] COLYER, J. F., and SPRAWSON, E. (1946) Dental Surgery and Pathology, 8th Edition, quoting de Jonge Cohen, *Proceedings of the Koninklinke Akademie van Wetenschappen te Amsterdam*, **41**, 12.
[2] DE JONGE, TH. E. (1948) *Schweiz. Monatschr. f. Kahnh.*, **58**, 137.

LOWER CANINE ERUPTING CENTRALLY

By E. F. PORTER, L.D.S.Eng.

The patient, female aged 25, presented for treatment. There was no observable abnormality in the maxilla. The upper incisors and left canine had been extracted.

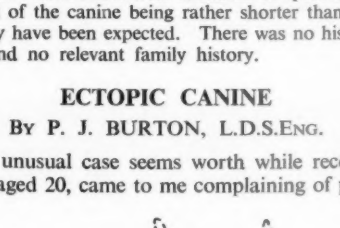
The left mandibular canine, however, was found to be erupting into a space between the two lower central

incisors. A radiograph showed that this canine was erupting vertically. For æsthetic reasons ⌈321 were extracted. Their roots were found to be quite straight, the root of the canine being rather shorter than would normally have been expected. There was no history of injury and no relevant family history.

ECTOPIC CANINE

By P. J. BURTON, L.D.S.Eng.

This unusual case seems worth while recording. A lad, aged 20, came to me complaining of pain in



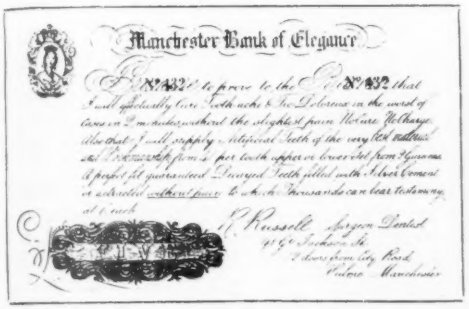
the left upper jaw. ⌊5 was carious and there was a roughened and discoloured piece of what I mistook

for a |6 root, and which he said was slightly tender. Under L.A. the |5 was removed fairly easily, but the other was very resistant and to my great surprise finally proved to be |3. I had noticed the |c root still present but never dreamt of meeting with the missing |3 in the |6 position.

It was lying with its labio-lingual axis running mesio-distally and the root inclined palatally to the |5. The rough diagram shows the approximate positions of the teeth.

AN OLD ADVERTISEMENT

In the early half of the nineteenth century it was not unusual for dentists to issue advertisements made up as imitations of Bank of England notes. The specimen, reproduced below, comes from Manchester and is


Manchester Bank of Elegance

headed " Manchester Bank of Elegance." It is not dated but the youthful portrait of Queen Victoria in the corner suggests that it was issued in the early years of her reign.

Practical Note

A REMOVABLE APPLIANCE TO COVER A CYST CAVITY

By PHILIP SAUNSBURY, L.D.S.Manc.
Prosthetics Department, Turner Dental School

Fig. 1 shows the cavity to be covered after a maxillary cyst had been marsupialised. Apicectomy and root filling were done on the |234, which were involved in the cyst, in an effort to retain them. No tooth was missing from the upper dentition.

The appliance constructed (fig. 2) consists of buccal and palatal clasps on the |67 and a plastic pad to cover, but not to penetrate, the cyst cavity. These two parts are connected by a bar which was cast with the clasps, in yellow gold (S.S.W. No. 17).

The problem of avoiding tissue trauma in negotiating the maxillary undercut was overcome by observing the following points :

(1) The use of the Ney Surveyor Technique in planning an accurate medial and upward path of insertion.

(2) Giving sufficient length to the bar connecting the pad to the molar clasps to obtain slight flexibility.

Fig. 1.—The cyst cavity.

Fig. 2.—The appliance.

Fig. 3.—The appliance in position.

(3) Lining the tissue surface of the hard acrylic pad with soft polyvinyl chloride resin.

The patient is able to remove and replace the appliance easily and comfortably during the healing period. Fig. 3 shows the appliance in position.

The photographs were taken by the Medical Photographic Department of the Manchester Royal Infirmary.

BRITISH DENTAL JOURNAL
APRIL 6, 1950

A WAY OUT

SPEAKING in the debate in the House of Commons on the supplementary estimates for the Health Services, the Chancellor of the Exchequer said " We must place a ceiling upon the total we can afford and see that *within that total the best use is made of our resources.*" The italics are ours. Assuming for the moment that the total cost of the dental services provided under the National Health Services and by local authorities during the past year represents such a ceiling, can it possibly be said that, as a nation, we are putting that sum to the best possible use in the interests of the dental health of the nation ? Professional and laymen alike who have any knowledge, however slight, of the facts of the present position, realise that the answer to that question is an emphatic negative. We are neither getting the best value for the money which is being expended nor, what is even more important, are we making the best use of the limited man-power available. This much is common ground, although it may be doubted whether all members of Parliament, who deplore the disorganisation of the school dental service, are fully alive to the more remote consequences of the curtailment of that service. It is obviously much easier to arouse sympathy for a child suffering with toothache than it is to excite enthusiasm for preventive dentistry. That, indeed, is natural. It is, however, gratifying to note that several speakers in the debate realised the importance of the long-term view in this matter. Mr. Iain MacLeod, for instance, said " If the teeth of expectant and nursing mothers and those of infants and young children be sound, then, in a generation, we will have dentally a sound nation." That is the doctrine which the British Dental Association has preached for many years and which, it was hoped, had been effectively adopted by the Government when those classes were accorded theoretical " priority " under the National Health Services Acts. There is no need now to labour the point that the term " priority " has proved to be a mockery ; that is universally agreed. What is imperative is that steps should be taken immediately to prevent the situation from deteriorating still further.

Whatever may be the outcome of the forthcoming negotiations with regard to the salaries of public dental officers, it is no longer possible to hope that the school service can be restored, in the near future, to the position which had been attained before July 5, 1948. New entrants to the profession are only sufficient in numbers to replace the inevitable losses by death and retirement, and the school service cannot be expected to attract more than a limited number of recruits. Unless, therefore, we are prepared to accept Dr. Hill's suggestion that we should " return to the old and more vigorous ' pull it out method ' in our schools and clinics," some short-term policy must be adopted to ensure that adequate conservative treatment is available for the children. Such a policy is outlined in the circular which the Council of the Association have issued. In effect, what is suggested is that the profession, itself, should take steps to ensure that effective priority is given to the treatment of children. A simple calculation shows that if the proposals of the Council are adopted by the great majority of dentists in the Health Service, the school dental service would be reinforced by the equivalent of approximately 900 full-time officers. A diversion of effort of this magnitude cannot be effected without a corresponding reduction in the facilities for the treatment of the adult population, and that reduction must, as things are, be brought about by the voluntary action of individual practitioners. This is, at best, an invidious task but, provided that it is carried out without denying anyone treatment for the relief of pain, some such kind of limitation is clearly in the best interests of the nation as a whole. It was, moreover, inherent in the oft-repeated statements of the Minister of Health that it was impossible to guarantee that full dental treatment would be available for the adult population on demand.

The Council have wisely refrained from putting forward a detailed plan by which their suggestions could be put into effect. Conditions, both in the school service and in private practices, vary to such a marked degree in different localities that no single plan would be suitable for all of them. The circular, therefore, does no more than make suggestions which form a framework on which local dental committees

and local education authorities can work out schemes appropriate to the conditions of each particular area, and acceptable to the practitioners who would have to work it. This is a challenge to the profession to show that its members are actuated by a desire to further the dental health of the community by ensuring that, whatever else may be neglected, the rising generation shall have an opportunity of reaching adult life with sound dentitions and a reasonable chance of maintaining them in a healthy condition. The scheme is put forward, not as a substitute for a fully manned school dental service, but as a supplement to that service, to enable it to cope with the grave emergency which has resulted from the operation of the Health Acts until, to quote the circular, " such time as the Ministries of Health and Education and the county and county borough local authorities have risen to their responsibilities by providing a proper service for the children." It is clear, however, that, even if it is to a steadily decreasing degree, some such complementary service will be needed for a good many years to come. It is, too, not to be overlooked that some local authorities may welcome the transference of the cost of providing dental treatment for children to the General Dental Services, and be content to maintain only a minimum service. That any such tendency would be frowned upon by the Ministries concerned may be taken for granted. If, however, it were to become at all widespread, the argument for placing the school dental service under the direct control of the Ministry of Health would be greatly strengthened, and recent events have provided a striking illustration of the dire results which can follow on the division of responsibility for services which are essentially parts of one indivisible whole.

NOTES AND COMMENTS

Health Service Estimates

THE Civil estimates presented to Parliament for the financial year 1950-51 put the cost of the General Dental Services at £46,565,000, of which approximately £41½ million is for services in England and Wales and £5 million for those in Scotland. The total asked for is a little over £2 million less than the corresponding figure for 1949–50. Bearing in mind that the reduction made in the scale of fees in June last year would not be fully reflected in the expenditure of the past year, it seems evident that the estimates are based on the assumption that there will be no diminution in the demand for dental treatment. The combined cost of the Dental Estimates Board and the Scottish Board is estimated at £564,000—an increase of very nearly 20 per cent on the total for the previous year. It is a little surprising to find, so long after the event, that a sum of £750,000 is provided in the estimates for supplemental payments to dentists in respect of work done under dental letters prior to July 4, 1948.

The Medical Bill

THE most striking change proposed in the Medical Bill presented to Parliament is the provision that before becoming fully registered a medical student must, after passing his final examination, spend at least a year in a resident medical capacity in one or more approved hospitals or institutions. He will also be required to produce a certificate showing that he has given satisfactory service in the hospital or institution. This provision was recommended by the Goodenough Committee. The Bill further proposes that the General Medical Council shall be empowered to appoint independent visitors to medical schools whose duty would be to report on the sufficiency of the course of instruction. It seems probable that corresponding powers will be conferred upon a Dental Council if and when it is constituted. Other proposals in the Bill are to increase the number of members of the G.M.C. to be nominated by the King to eight, of whom five are to be registered medical men and three laymen. The number of elected members of the Council is also to be increased to six for England and Wales and two for Scotland. Disciplinary cases instead of being heard as at present by the whole Council are to be dealt with by a discipline committee consisting of the President and sixteen other members of whom at least six must be elected members of the Council and one a layman. Provisions are also made for an appeal against disciplinary action to the Judicial Committee of the Privy Council. This is an innovation as previously a doctor who was the subject of disciplinary procedure had no right of appeal.

Training of Dental Hygienists

THE statement on the training of dental hygienists issued by the Ministry of Health (*see* p. 198) is, perhaps, unavoidably vague in regard to many matters on which fuller information would be welcomed equally by those members of the profession who are in favour of the training of hygienists and those who are opposed to the project. This lack of detail invites a series of questions to which the

members of the sub-committee observing the experiment might profitably address themselves. Dentists who wish the experiment to succeed would, for instance, like to be assured that the syllabus which is being followed has been drawn up with due regard to the special needs of hygienists and that the instructors have adequate experience of the requirements of such a course. In this connection it is important that, since the hygienists are to work " under the supervision and responsible direction of a registered dental practitioner," care should be taken during their training to ensure that they are accustomed to work under the closest possible degree of supervision by a dentist. It is, moreover, worthy of consideration whether it might not be desirable at a later stage to institute short courses for dentists who are to be responsible for supervising the hygienists after they have passed out from the school. We are told that the trainees are to be required to take an examination but no indication is given as to who is to conduct the examination nor even by whom the examiners are to be appointed. It may be assumed that as the Ministry will wish the experiment to be a success that they will have satisfied themselves that the examination is conducted on proper lines. The profession would, nevertheless, welcome some more exact information on this point.

Educational Films

It is not widely known that the publishers of the Encyclopædia Britannica are also producers of educational films. These films are produced in the U.S.A. and several on biological subjects have recently been introduced into this country and have been given new sound track commentaries to meet the needs of British audiences. Those on "Heart and Circulation," "Work of the Kidneys," "Digestion of Foods," "Body Defences against Diseases," "Teeth," are very effective in explaining to lay audiences in a simple way the manner in which the body works. The film entitled "Teeth," in addition to explaining how teeth develop, shows how by eating proper foods, regular oral hygiene and frequent visits to the dentist, dental disease may be prevented. The toothbrush technique demonstrated in the film is not one which would receive universal approval in this country but this detracts very little from the general value of the film. The films, which appear to be most suitable for showing to senior classes in schools, may be either purchased outright or hired for short periods at a moderate charge. Particulars may be obtained from Encyclopædia Britannica Ltd., 12, Buckingham Street, London, W.C.2.

Fifty Years Ago

From the "Journal of the British Dental Association," April 14, 1900.

We learn that the London School Board have decided to engage the services of a dentist for their Gordon House Girls' Home. Twelve guineas a year is mentioned as the remuneration to be given. The Board are also about to appoint a dentist for the "Shaftesbury" training ship, at a salary of £70 a year. The activity displayed by the Bristol Board of Guardians in a similar direction appears to have resulted less satisfactorily, as we learn that the question of dental attendance for the workhouses and homes gave rise, at a recent meeting, to some discussion, one member contending that the doctors engaged by the Board should look after the teeth. Finally, the paragraph in the report of the Schools and Boarding-out Committee, which had occasioned the discussion, was, we regret to say, outvoted.

LETTERS TO THE EDITOR

" PRECISION DENTISTRY "

Sir,—Whilst all will admire the optimism and generous sentiment expressed by Dr. Rowlett in his letter published in the Journal Supplement of March 17, some centres of advanced conservative thought and practice may take rather hardly his description of the American Dental Society of London as " the foremost representatives of precision dentistry in Great Britain," charming and highly talented though its members are. The moment, however, is opportune to query the use of the term " precision dentistry," which is being so widely used nowadays as to have achieved a somewhat snobbish connotation indicating the sort of dentistry one does oneself and which the other fellow doesn't ! Although this may be dismissed as a cheap cynicism from one who has seen the " latest and best " methods come and go with monotonous regularity in the last two decades, the fact remains that the term " precision " is almost wholly inapplicable to the art and craft of dentistry and only brings smiles to the face of the man whose real domain it is, namely the engineer and particularly the mass production engineer. The successful practice of advanced conservative dentistry calls for many qualities, complete control of the patient, patience, skill and unremitting diligence, a mastery of method, and a sense of clinical judgment, coupled with a critical appreciation of one's work, with standards based on the " feel " of a restoration, its appearance to the eye and magnifying lens and so on. These qualities are not the prerogative of any one school of thought or nationality, and are not superseded by employment of any particular technical methods, interesting and time saving though the latter may be, and to persuade by overt implication that such is the case will be a grave disservice to our art and craft. The engineer, however, is on firmer ground ; he can firstly choose the limits of precision to which he will work, and can keep within the tolerances of the limit set by gauge checking at every stage ; in dentistry, " in vivo " gauge checking of fit is impossible and tests such as apparent interchangeability of specimens on models would be considered

laughable by engineer's standards. Secondly, the engineer can foretell with exactitude the results of straying beyond the tolerance limits he has set, for instance a 0·0005″ error in the interference fit of a male and female component might prevent the successful joining of the parts under pressure, and would lead to the spoiling of both when pressure was applied. Grave results indeed may accrue, for instance the seizure of a bearing, due to undetected limit errors, in a highly stressed assembly like an aeroplane engine, and might lead to utter disaster and death to many. In dentistry no such fixed rules apply and it is the operator alone, as master craftsman knowing his patient, who can foretell the success or failure of his restoration. Thirdly, and this is the hub of the whole matter, the engineer can *buy* precision to any limit he sets himself. For example, a lathe costing £100 in the hands of a first-rate operator can produce work to limits of a thousandth of an inch with care, with a £400 lathe the same results can be secured with less care, or finer results with equal care, whilst with an automatic costing thousands, a wholly unskilled operator can churn out workpieces by the hundred having plus or minus tolerances of as little as 0·0003″ each ! There is no need for me to emphasise that in dentistry precision cannot be bought, and in this, parodoxically enough, lies the fascination of our craft.

In this matter I have a foot in both camps, being an enthusiastic amateur engineer of the relatively humble "± one thou" variety and although I bear with good grace the kindly condescension of my precision engineer friends, I should hate to feel that any dentist friend of mine should have to suffer a like fate at the hands of his "precision" colleagues.

Might I, therefore, in all diffidence, suggest a new word be coined, which might even be incorporated in the motto of any dental society, to be more evocative of the spirit of the true craftsman, the spirit that drove Grinling Gibbons and Albrecht Durer and others to works of genius, so that this cold and scientific term be left to those in whose safe keeping it can be trusted to remain.

8, *Lower Sloane Street*, *S.W.*1. Yours faithfully, ROBERT CUTLER.

NUTRITION AND SCHOOL DENTISTRY

SIR,—The School Dental Service having been wrecked, the profession is giving much consideration to the children's dental problem.

The current talk of half-trained operators, lowered standards of qualification, and trips round the world, to find a method of dealing with the problem, seem to be so lamentably like the car manufacturer, who spent much time, thought and money experimenting on a new design and when it proved unsuccessful studied writings on the subject in the reference library, only to discover that all his ideas had been tried out in America some years before and found wanting. If those concerned about school dentistry refer to Nutrition and Physical Degeneration, Weston A. Price, 4th Reprint, 1945, they will find ample evidence from all over the world, that white flour, tinned foods and other items of Western civilised diet have resulted in physical degeneration including the chaotic dental condition of our child population.

On page 289 skiagraphs of teeth with carious exposures are depicted on the left and on the right the same teeth healed by natural process when the nutrition was adequately improved.

The treatment was a reinforced meal given at noon six days a week at a mission over a period of three to five months. All home meals and treatment remained as before.

Is it not time the mid-day school meals were prepared on the lines advised by Weston A. Price on page 290 ? Senior school dental officers would solve their staffing problems and improve the health of the nation if they would educate the suppliers and producers of the mid-day school meals in the principles of nutrition laid down by Weston A. Price.

Perhaps, someone else will call the attention of the Ministries of Health, Food and Agriculture to the work of McCarrison who, twenty-five years ago, demonstrated the superiority of foods produced by organic agriculture. Then the wheat supplied for the freshly ground whole wheat roll included in the Weston Price meal could contain all the salts, and fat soluble and water soluble vitamins necessary to obtain a like success.

Lord Semphill has advised against murdered food from poisoned soil.

6, *Eaton Road*, *Coventry*. Yours faithfully, STANLEY P. MEACOCK.

CARIES IN NEW ZEALAND

SIR,—May I commend to your correspondents, Messrs. A. G. Kirby and G. W. Sawyer, a condensation of a paper "Biology and its Relation to Soil Erosion and Soil Conservation in New Zealand," A. J. Healy, M. Agr. Sc., in the current issue of *Mother Earth* (Winter 1949–50) and also to the *South African Dental Journal*, July 1946, pp. 198, 199—both obtainable from the Robert and Lilian Lindsay Library ?

Pickerill showed that before the white man discovered N.Z., Maori were the most immune to caries of all the races, even more immune than the Eskimo. Then a pricelessly rich soil, it has now been devastated by reckless deforestation, overgrazing and the further destruction of vegetative cover by the rabbit. Only its favourable climate saves it from becoming as bare as the Sahara. Now it has the world's worst teeth, and one of the highest systemic disease incidence of any modern white race.

Granville Road, *London Road, Leicester*. Yours faithfully, EVERARD TURNER.

PREVALENCE OF IMPACTED PREMOLARS AND CANINES

SIR,—Mr. J. R. Toller's query in your issue of March 17 leads me to draw his attention to that excellent book which is in the B.D.A. library entitled "Nutrition and Physical Degeneration" in which the late Dr. Weston Price recounts his travels and researches. From them he deduces that abnormalities such as impacted teeth are due to malformation, caused by our modern (deficiency) diet, and that they occur in the children of native races whose parents were normal but who had taken to the white man's diet before conceiving the children in question.

6, *Fernleigh Road*, *Winchmore Hill*, *N.*21. Yours faithfully, F. J. MASON BUSTARD.

REVIEWS AND ABSTRACTS

THE CHEMISTRY AND METALLURGY OF DENTAL MATERIALS. Second Edition. By J. Campbell Smith, B.Sc. Oxford: Blackwell Scientific Publications Ltd. Pp. 323. Price 21s.

This new edition remains basically the same as the first edition which was published in 1946, with the exception of certain minor additions. It is designed primarily to provide dental students with information on the composition, properties and scientific uses of dental materials. The practitioner will find the book helpful, as for example in analysing difficulties such as faulty processing of acrylic resin. The book follows closely the syllabus for the City & Guilds course in "Dental Metallurgy" for dental technicians.

The book is divided into three parts: (1) Metals and alloys. (2) Inorganic materials other than metals. (3) Organic materials, including a section on organic chemistry.

Part 1 deals in the main with the properties of the more important metals and alloys which are used dentally; and the effect of various manipulative practices on such properties, e.g. the effect of mechanical work and heat treatment on the physical properties of gold alloys.

A certain amount of practical detail is also presented, as in the chapter on dental casting, which includes a new section on vacuum investing. Other chapters include ones on the dental amalgams, corrosion and electroplating, and the practice and use of the microscopical examination of metals and alloys.

Part 2 deals in a satisfactory manner with vulcanite and the dental plastics, and also included are short chapters on waxes, anæsthetics, antiseptics and disinfectants.

Finally, the book concludes with a series of chapters dealing with organic chemistry. It is felt that the latter chapters can be found in most textbooks of organic chemistry, and that the space they occupy might have been better devoted to a more detailed survey of some of the dental materials themselves.

The Organic Basis for the So-called Tufts and Schreger's Bands in Enamel.—It is possible to preserve and examine the relatively gross structure of the organic framework of adult enamel of teeth fixed for a period in 10 per cent formalin, by decalcification with 5 per cent trichloracetic acid. In order to minimise the destructive influence of bubbles of carbon dioxide the process is carried out in an icebox at 1° C. and the teeth are immobilised in individual celloidin bags. After exposure to acid for an hour the enamel cuticle becomes slightly elevated from the enamel surface and after a period of 2 days to a fortnight, according to the size of the specimen, the enamel looks like a transparent cap, which is very fragile. After careful washing while still in the celloidin bag, the specimen of enamel can be dissected while submerged in water and strongly illuminated, and with the aid of a binocular dissecting microscope. The outer part of the enamel could be dissected away easily but the inner part was more dense and rigid and could be elevated from the dentine surface. This was facilitated by the fact that it rested upon a fairly solid basement membrane. It was found that where the dentine presented a comparatively flat surface the prisms pursued a fairly straight course and produced an even pattern in the enamel but where the dentine surface was uneven and scalloped the similarly uneven basement membrane of the enamel matrix was harder to separate, and the indentations in the dentine surface served as starting points for the regularly spaced dense wavy bundles of prisms sheaths that produce Schreger's bands. It is therefore suggested that the morphology of the external dentine surface, which embryologically precedes the formation of enamel, may have a bearing on the pattern of the organic framework of the inner enamel and may be reflected in the surface texture of the enamel in cases where a scalloped dentine surface is covered with only a thin shell of enamel.—SOGNNAES, R. F. (1949) *J. dent. Res.*, **28**, 549.

Bilateral Hypertrophy of the Masseter Muscle.—A young woman was concerned at the extreme width of her lower jaw. This was found to be due almost entirely to hypertrophy of the masseter muscles to about three times their normal size. Incisions were made behind the angles of the mandible and the masseters were detached from their insertions. About two-thirds of the inner aspects of the lower portions were excised. The bony angles were found to be slightly prominent and were trimmed. Histologically the mass removed was merely normal muscle and bone. There was some temporary limitation of opening but six weeks later this had disappeared and the contour of the face was materially improved.—ADAMS, W. M. (1949) *Brit. J. plastic Surg.*, **2**, 78.

Bacteræmias Following Surgical Procedures.—The incidence of transient bacteræmia following dental extractions and scaling in 221 cases was about 10 per cent, which is much lower than most other reports. The incidence was higher in older patients and was roughly proportional to the degree of trauma, for example, bacteræmia was more likely if several teeth were extracted than if single teeth were extracted. The presence or absence of parodontal or periapical disease did not appear to influence the incidence.—LAZANSKY, J. P., ROBINSON, L., and RODOFSKY, L. (1949) *J. dent. Res.*, **28**, 533.

THE HEALTH SERVICE

TREATMENT OF SCHOOL CHILDREN

Council's Recommendation to the Profession

THE following letter has been circulated by the Council of the British Dental Association to members of the Representative Board, branch and section secretaries, secretaries of local dental committees and the Press Association :—

The Council of the British Dental Association, at its meeting on Tuesday, March 21, 1950, viewed with grave concern the failure of the National Health Service to provide the guaranteed priority dental service for school children, young children of less than school age and nursing mothers, and the continued failure of the authorities concerned to remedy this grave error despite the constant representations made by the Association.

The Council decided that members of the Association should be called upon to organise and maintain in their surgeries their own priority service for school children until such time as the Ministries of Health and Education and the county and county borough local authorities have risen to their responsibilities by providing a proper service for the children.

The Association considers that undue emphasis has been laid in the National Health Service upon dental treatment for the middle-aged and elderly and that the dental health of the children of the nation has thereby suffered. Members of the dental profession are aware of the vital necessity of preserving the natural teeth of the youth of the nation and will make every effort to undertake as an emergency measure this important national task.

The Association recommends its members to set aside not less than one half-day each week solely for the treatment of school children who are unable to obtain dental treatment through the breakdown of the Local Authority School Dental Service. They should treat such children under the terms of the General Dental Service. Members are asked to notify their local dental committee of their willingness to take part in this scheme and local dental committees are urged to undertake the arrangements which will be necessary.

Suggestions for Working the Scheme

The Association does not wish to interfere in any local arrangements that can be made between local dental committees and the local authorities. They wish, however, to make the following suggestions :—

1. Local dental committees should ensure that all dentists in their area are given the opportunity of volunteering and stating the days and hours that they are willing to put aside.

2. In making arrangements with local authorities, local dental committees should ensure that all dentists who have volunteered shall be given the opportunity to see patients.

3. Patients must be given free choice of dentist. They should be shown a list of those who have volunteered, the list to contain names, addresses, telephone numbers and times.

4. Treatment should be given by appointment only, the appointments to be made either by the education authorities or by the patients themselves.

5. Education authorities should be told that parents or guardians must accompany the children in order to sign the necessary forms.

6. The profession should be urged to keep the times stated free of other patients up to at least twenty-four hours beforehand.

The Association hopes that local authorities will co-operate with local dental committees in this attempt to rectify the present deplorable state of affairs.

The Association is confident, though its members are working very long hours in an attempt to cope with the demand for adult dental treatment created by the National Health Service Acts, that they will be willing to make available to the children of their area some of the time which they now devote to adult dental health. No national dental health service can succeed in improving the dental health of the nation unless the children and adolescents are first made dentally fit.

HEALTH SERVICE SUPPLEMENTARY ESTIMATES

DEBATE IN PARLIAMENT

On March 14 the House of Commons debated a number of supplementary estimates including one for the Health Service. The Chancellor of the Exchequer said that the pharmaceutical services and dental and supplementary ophthalmic services between them showed an excess of about £45,000,000 on the financial year 1949–50. Though there was an element in this of price changes, by far the greatest factor was the element of consumer demand. There had existed a large pent-up demand and there was no possible way of estimating how big it was, or how long it would last. In fact it continued much longer than was estimated at a much higher level, and only now was the curve of demand beginning to flatten out. He said, however, that he now believed it necessary to call a halt to further development of the health services. The estimates for the year 1950–51 must be regarded as a ceiling beyond which the Government must not be carried by new developments, or extensions of existing services, which could not be provided out of ascertained economies in other directions.

The Priority Services

Dr. Charles Hill (*Con., Luton*), in his maiden speech, after speaking about economies in the hospital services, dealt with the dental service. He said that in his view the greatly increased cost of the dental service, and, even more important, the tragedy of the decay of the School Dental Service, were attributable to three main causes. There were too few dentists to provide a comprehensive dental service, however it was organised. The Spens Report was not being applied to the School Dental Service, with the inevitable result that dentists in considerable numbers were leaving for other remunerative forms of work. Third, the present system of remuneration, being the same for all qualities of work, provided for the minority an incitement to hasty, and so unsatisfactory, work.

The solution was one of immense difficulty. If the children and mothers were to have priority service, steps must be taken to attract back into those services the practitioners who had left. The fact that a comprehensive service for all could not be provided, because of the shortage of dentists, would then not be so tragic to contemplate. It would mean that outside the priority groups there would be a fixed sum of money which would be available as grants-in-aid for those whose needs were less in the dental field.

Dr. Barnett Stross (*Lab., Stoke-on-Trent*) said people were now beginning to realise that the dentists as a whole had done a very good job. He wondered whether the Minister could not cut the Gordian knot of the priority classes fairly simply by stating as a condition of service for the dentist that he should treat a percentage of children. He thought it well worth while asking the dental profession whether they would not work out their own scheme in that particular way. The public were becoming very restive over the fact that the people who needed dental care most were those who tended to be most neglected because the dentists did not find time to do the work for them.

Mr. Iain MacLeod (*Con., Enfield West*) remarked

upon the fact that the dentist was being paid by the State far more in terms of net income than was the doctor. He felt that this was an indefensible position. Mr. MacLeod also spoke of the plight of the priority classes and said that in many areas of the country the School Dental Service had virtually broken down. Wherever the responsibility lay—and he knew that it caused the Minister of Health, the Minister of Education and the Secretary of State for Scotland great concern—the fact was inescapable that almost the only thing that was made deliberately by the Government a priority in the Health Service had failed.

Demand and Cost

Mr. J. Baird (*Labour, Wolverhampton North-East*) said that wherever there was an itemised scale of fees there was a great temptation to put private profit before national interests. This was the explanation for the swollen estimates for the dental, ophthalmic and pharmaceutical services. They were open to grave abuse.

He remembered, shortly after the National Health Service was introduced, travelling with a distinguished dental surgeon who was Chairman of his Local Dental Committee. He had told Mr. Baird that he had resigned his position because at every meeting he went to the dentists who gathered there, instead of discussing professional matters, spent almost all the time discussing ways and means of getting round the Regulations of the National Health Service. This was typical of a certain number of the profession at least.

Mr. Baird defended the failure to make a closer estimate of the cost of the dental services. He recalled that in evidence before the Teviot Committee the British Dental Association had said there was no reason to believe that the existing dental population could not satisfy the dental needs of the people. He quoted from a pamphlet issued by the Association at the beginning of 1948, which stated the view that providing the conditions of service in the Health Service were attractive enough to bring in the full strength of the profession, there were sufficient dentists to meet any demand that was likely to take place in the immediate future under the National Health Service Act. Mr. Baird asked how the Minister could be expected to assess the demand for dental services when the profession itself could not assess it.

There had undoubtedly been a certain amount of over-prescription in the National Health Service and a certain number of people had obtained dentures although they already had a fairly efficient set. The Opposition were always asking for clinical freedom for the dentist, and the dentists had received about 99 per cent of clinical freedom. If there was any over-prescription the fault therefore lay with the profession. As long as practitioners were paid on an itemised scale of fees there was always a temptation to supply further dentures because it meant more profit.

Dr. Hill had suggested a scheme of grant-in-aid but this would not work in the dental services. He believed that in the long run the best way of saving money was to set up a fully salaried medical service. He had come to the conclusion, and he thought the House would agree with him, that members of the dental profession were being paid too much under the Act and that there must be a further cut in their income.

The main reason for the breakdown of the School Dental Service was because inflated salaries were being paid in private practice. The incomes of School Dental Officers had in fact increased considerably but against this the dentist in private practice was making far more than was recommended by the Spens Committee. The solution was not to pay dentists in the School Service as much as those in private practice were paid. If the School Dental Officer were paid £1,200 or £1,300 on a rising scale, solicitors and doctors would want to go up too.

The main culprits in the School Dental Service were the dentists themselves, for the school dentists had allowed negotiations to be conducted for them by the British Dental Association. Whitley machinery had been offered to the school dentists but the Association, for political purposes, had refused to use that Whitley machinery. This had been going on for two years and he hoped that members of both sides of the House would bring pressure to bear on the dentists to go into the Whitley machinery and get the matter settled as soon as possible.

The biggest saving which could be made in the dental services was to increase the supervision exercised over the dentists in private practice, but the Ministry of Health dental inspectorate and the Estimates Board in Eastbourne were breaking down because their staff were drifting into private practice. He proposed that the salaries of the Inspectors should be increased and he estimated that if the Minister employed a further thirty Inspectors at a cost of £45,000 he would save many millions of pounds on the cost of the Health Service. The dentist had proved that he was not worthy of clinical freedom. There must be more supervision than at present and it could only be done by paying the Inspectorate a higher salary than at present.

Replying to the debate, the **Minister of Health** made few specific references to the dental service. He said that it had been quite impracticable to forecast the demand on the Health Service when the estimates for 1949–50 were drawn up. After speaking of possible economies in hospital administration he went on to say that some economies ought to be made in the cost of proprietary medicines and by bulk purchase of materials required in the Health Service. He spoke of the effect of monopoly upon the price asked for glassware in hospitals, and then referred to dental goods, saying that the Monopolies Commission were considering a price fixing cartel for dental goods at the request of the Ministry, who knew very well that dentists were being held up to ransom by a price-ring.

QUESTIONS IN PARLIAMENT

Health Centres.—In reply to a question asked by Mr. Somerville Hastings (*Lab., Farking*), the Minister of Health said that before approving a Health Centre for medical practitioners it was his practice to obtain an assurance from the Executive Council, after consulting the Local Medical Committee, either that enough local doctors wanted to practise there or that the need for more doctors in the area would justify advertising vacancies. Mr. Bevan also said that a special committee of the Central Health Services Council was exploring the whole question of the lines on which Health Centres should be developed.

Emergency Cases.—Mr. A. H. Albu (*Lab., Edmonton*) asked the Minister of Health what instructions he had given to Executive Councils on the treatment by dentists of cases of emergency.

Mr. Bevan said that he would send to Mr. Albu a copy of the circular sent to Executive Councils when a simplified procedure for emergency treatment was introduced. Mr. Albu then asked whether the Minister was aware that there were still some dentists who refused to have emergency patients without payment. The Minister replied, "There are some instances where dentists still behave in a most unprofessional manner."

Dentures.—Dr. B. Stross (*Lab., Stoke-on-Trent, Central*) asked whether the Minister was aware that some dentists used plastic teeth for permanent dentures; and whether he would advise against this practice on the grounds that the teeth stain and wear away in a short time.

Mr. Bevan replied that dentists were permitted to use either acrylic or porcelain teeth of first class quality and that teeth of this quality did not stain but lasted as long as the average life of a denture.

Public Dental Service

SCHOOL HEALTH SERVICE ANNUAL REPORTS FOR 1947

Cumberland County Council.—Mr. A. C. S. Martin, Senior Dental Officer, comments on the difficulties and implications due to shortage of staff and also of treatment premises. Mr. Martin also reports an increase in the amount of orthodontic work undertaken and in the number of partial dentures provided for school children and the adoption of a policy of providing children with crowns and inlays in suitable cases.

East Ham County Borough.—Miss H. T. Smith, Senior Dental Officer, reports that the staff of three dental officers were able to inspect all children in attendance at schools (15,000) at least once during the year and that those in the higher age groups (12 to 18) had been dealt with twice. Miss Smith also comments that more than 50 per cent of the children inspected were found to have sound dentitions. There is obviously a big difference between the dental conditions of children in East Ham and those of Hendon referred to below.

Borough of Hendon.—The School Health Services at Hendon are administered for Middlesex County Council by the Hendon Borough Council and a separate report in respect of these local services is issued by the Medical Officer for the Borough. In the dental section Mr. K. C. B. Webster, the Divisional Dental Officer, reports that the staff for 15,497 children consisted of 5 dental officers, 5 dental attendants and 5 clerks. Under such satisfactory staffing conditions it is rather surprising that only half the school population (7,262) were dealt with at routine inspections in schools and that no less than 3,012 children were dealt with as "Specials." 5,828 individual children were treated during the year and made 19,043 attendances at the clinics—no less than 3,745 of these attendances being in respect of orthodontic treatment. A considerable amount of dental treatment was also carried out for expectant and nursing mothers and children under school age.

Newcastle-on-Tyne County Borough.—Mr. J. C. Brown, Senior Dental Officer, comments that the dental service was not able to provide all types of dental treatment and that the dental staff was numerically inadequate to meet the needs of the school population, only 16,495 of whom received treatment during the year. As compared with many other local authority areas, the necessity for extractions was low, amounting to only 2,804 permanent teeth and 10,441 temporary teeth, giving an average of less than one tooth extracted per child treated.

Parliamentary Intelligence

TREATMENT OF SCHOOL CHILDREN

THE problem of securing adequate treatment for school children was discussed in Parliament on the motion for the adjournment on March 8. The matter was raised by Mr. George Thomas (*Lab., Cardiff, West*) who said that there had been a most unfortunate delay in this matter. It had been reported recently in Cardiff by the School Medical Officer for the city that 2,169 cases were awaiting fillings, 3,340 were awaiting extractions and that of the latter approximately 1,000 were cases of toothache.

Mr. Thomas wondered whether an approach could not be made to the dental profession to ask them if they could get local dentists to agree to give certain sessions for school work, perhaps by rota among themselves. He also put forward the suggestion that newly qualified dentists should be required to serve a minimum period in the schools before going into private practice, and that "we might break down some of the restrictions at present practised by the dental profession."

Col. Stoddart-Scott (*Con., Ripon*) pointed out that before the National Health Service there was one dentist for every 3,000 children in the schools. To-day, with the National Health Service Act on the Statute Book, which instructed the Minister of Health to produce a priority dental service for the schools, there was not one dentist for every 3,000 children but one for every 6,000 children. Once again our children were the victims of the National Health Service when they should be the beneficiaries. While the Act did not compel the Minister to provide a dental service for everybody else, it did insist on his providing a dental service for the school children, but that the Minister was not doing. Col. Stoddart-Scott hoped that the Minister would give some assurance as to how the people would be helped and not made victims of the Health Service.

The Parliamentary Secretary to the Minister of Health (Mr. Blenkinsop) then spoke about the steps which the Ministry had taken to deal with what was agreed was a serious position.

He said that the country was up against an overall shortage of dentists. The fact was that many dentists had unfortunately been attracted into private practice by the higher rate of payment. The Ministry were doing all they could to encourage the training of more dentists as that was obviously the long-term solution. In the meantime, some local education authorities—for this was the responsibility of the education authorities, though naturally the Ministry were most concerned in it—had been able to make up for the loss of full-time school dental officers by securing the part-time services of

practising dentists on a sessional basis. Cardiff was a case in point where they were in a better position in regard to school dentists to-day than they were some years ago. Cardiff had been able to meet the danger there by the employment of part-time dentists—although he would not say that they had enough. The Ministry hoped that these appointments, by which dentists in general practice would be able to offer some sessions in the clinics and for the School Dental Service, would be extended to other areas where there were difficulties.

Mr. Blenkinsop said that the position varied very much from one part of the country to another, but where there were difficulties, the Ministry hoped that the local education authority, together with the professional committees, would approach practising dentists to secure, if possible, their co-operation in this way. He was sure that this would be approved of heartily by the general public, and it should be possible for dentists generally to co-operate in this way to maintain what all agreed was a most vital part of the Health Service by ensuring the inspection of teeth as well as the treatment for them.

Dr. H. M. King (*Lab., Southampton, Test*) took up again the suggestion made by Mr. Thomas, asking the Minister to investigate the possibility of requiring dentists to undertake one or two sessions of School Dental Service as part of the conditions of their going into the dental service. He said that it was unlikely that sufficient school dentists could be recruited in any reasonable time, and it might be a practical solution of a very difficult question if the Minister would look at the terms of dentists employed in the Health Service so as to ensure that they did a session for school children as part of their duties.

QUESTIONS IN PARLIAMENT

School Dental Service.—Mr. Janner (*Lab., Leicester, N.W.*) asked the Minister of Education whether he was satisfied that sufficient numbers of dentists would now be available for schools throughout the country.

The Minister of Education replied "No, Sir; in January last the school dental service employed the equivalent of 738 full-time dentists by comparison with 921 in 1948, when the service had fully recovered from the effects of the war. Although last year the net loss was very serious, there were nevertheless over 100 new entrants and I hope that the negotiations for a Dental Whitley Council now proceeding will lead to a settlement of salaries and the restoration of the service to its former efficiency."

Monopolies Commission.—In reply to a question by Mr. Elwyn Jones (*Lab., West Ham, South*) the President of the Board of Trade said that he was hoping to receive a report from the Monopolies Commission on dental goods in the summer of this year.

Dental News

DENTAL GROUP DINNER

TICKETS are still available for the Group Dinner at the Mayfair Hotel, London, on Friday, April 21, at which the Group Movement will be formally wound up. The Council of the British Dental Association are to be the Guests of Honour at the dinner. Tickets (restricted to members of Dental Groups) may be obtained from the Hon. General Secretary, Central Committee of Dental Groups, 56, Hendon Lane, London, N.3. Applications should be accompanied by a remittance of £1 12s. 6d. per ticket.

TRAINING OF HYGIENISTS

THE Ministry of Health have issued the following statement on the experimental course of training for dental hygienists which is being carried on at the Eastman Dental Clinic :—

The Teviot Committee on Dentistry, as dentists will know, recommended the institution of a scheme for the training of oral hygienists on such a scale as would provide an adequate test of their value.

After consultation with the Dental Board, the Minister of Health decided to implement the recommendation and has instituted a controlled experimental scheme which visualises—in addition to the employment of those ex-R.A.F. hygienists who are able and willing to take part—the training of a limited number of additional hygienists over a period of some three years.

The Minister requested the Standing Dental Advisory Committee to co-operate in observing the inception and progress of the experiment. For this purpose, the Committee appointed a Sub-Committee under the Chairmanship of Mr. H. T. Roper-Hall. Membership of the Sub-Committee includes nominees of the British Dental Association and of the former Incorporated Dental Society and the Public Dental Service Association, and of the Dental Board, and observers nominated by the Ministries of Health and Education and by the Department of Health for Scotland.

Since the work of hygienists is essentially preventive, their training lays special emphasis on the teaching of oral hygiene. Their operative work is limited to the removal of tartar and cleaning of the teeth, and, where directed, the application of such prophylactic measures as the topical application of sodium fluoride. The course of training, which covers an academic year of three terms, is essentially practical, some 70 per cent of the time being spent in manual instruction. Tooth carving in wax, finger and wrist exercises, " phantom head " work and appropriate background lectures form the bulk of the first term's work. In the remaining two terms, the pupils commence work on patients, and have further lectures on background with special reference to oral hygiene instruction.

The first course is being held at the Eastman Clinic under the personal direction of the Director with the assistance of his staff.

Fifteen candidates were selected from some eighty-three applicants, special attention being paid to general aptitude (a number of the girls selected had previously been dental attendants), educational standard, personality and manual dexterity.

It is proposed that a further course will commence at the Eastman Clinic shortly, so that there will be thirty pupils in all under training at the Clinic. In the light of experience of these courses, other centres may be opened in the provinces.

On the completion of training, the hygienists will be required to take a written, oral and practical examination. Successful candidates will be awarded a certificate of proficiency, and will then be in a position to accept posts offered by authorities with the Minister's approval in the public dental service, working under the supervision and responsible direction of a registered dental practitioner.

CARDIFF DENTAL POST GRADUATE COMMITTEE

CARDIFF Dental Post Graduate Committee have arranged three intensive three-day courses in Oral Surgery. The first of these was held last month and the second, to held in May, is already full. The third course is to be held during the weekend, November 10, 11 and 12.

This is to be given by Professor Talmage Read, F.D.S. R.C.S.,Eng., Dean, Leeds Dental Hospital, and will consist of lectures on "The Anatomical Basis of the Work," "Oral Pathology" and "Operative Technique," to be given on the first two days, and two sessions of practical demonstrations on the third day.

The fee for the course is £3 13s. 6d. Applications, limited to 12, from practitioners in the Cardiff area, should be sent to the Honorary Secretary of the Committee, Mr. Reginald F. Hoar, 6, Windsor Place, Cardiff.

The Schools

BIRMINGHAM DENTAL HOSPITAL

Presentation to Mr. Kitchen

THE presentation of a cheque and a refrigerator to Mr. W. C. B. Kitchen from the Staff of the Dental Hospital and School and past and present students, in recognition of his thirty years' service to the School as Instructor in Dental Mechanics, will take place at the Dental Hospital on Thursday, April 20, at 5 p.m.

Examination Results

University of Sheffield.—*Final L.D.S.*—Shirley Davies, W. J. Fisher, Maureen McGirr, R. R. Nalliah, T. C. A. O'Neil, J. E. Swindells, G. L. Woolass.

The Services

RE-UNION DINNER R.A.F. DENTAL BRANCH

THE 4th Annual Re-union Dinner for past and present officers of the Royal Air Force Dental Branch will be held at the Cafe Royal, Regent Street, W.1, on Friday, May 5, 1950, at 7 p.m. for 7.30 p.m. (evening dress and decorations). Applications for tickets, together with remittance for one guinea for each ticket, should be forwarded to the Honorary Secretary, R.A.F. Dental Branch Re-union, 40, Alexandra Road, Epsom, Surrey.

Obituary

PROFESSOR BERNARD GOTTLIEB

WE regret to record that Professor B. Gottlieb died on March 16 at Dallas, Texas, after a short illness, in his sixty-fifth year.

E. W. F. writes :—

Gottlieb's death marks the end of the beginning in the process of applying modern scientific method in research to the art of dental practice ; for his work is a monument set on the grave of dental empiricism.

No one who was in close contact with international affairs in dentistry between the wars will ever forget the picture of Gottlieb, with his young associates in close attendance, lecturing with enormous emphasis and earnestness to a throng of eager colleagues. Sometimes he was telling the story disclosed by the superb photomicrographs of his unique histological preparations. On other occasions he was demonstrating the use of some instrument he had devised, or was teaching a new technique for carrying out some difficult operation ; but always his clinical teaching was based on his laboratory research.

When he wanted to know something Gottlieb did not guess ; he looked, and he made experiments ; but only after that did he argue ! Dentistry was a passion with him. It is recorded over his signature in the archives of the Association that he had no interests outside dentistry. There is his stark uncompromising reply to the formal question: " Hobbies, particulars of interests other than dentistry." " Nothing," he writes, contemptuously I think, and that is the key to a proper appreciation of Gottlieb's character and life's work.

I have seen the veins stand out on his forehead, his face suffused, his fists beating the air, as he angrily paced the council chamber where some principle of dental pathology was being discussed. " I will die," he cried, " before I will agree to call it paradentosa." And we thought it an extravagance. Some of us from this side of the Channel were a little amused, oblivious of the tragedy that hung over him, and us, or of the superb courage of his declaration. For it was no idle piece of rhetoric ; there were political forces at work in that very room propagating the spurious pseudo-science of Nazi Germany ; and the forces were challenged, as Gottlieb meant them to be, by that declaration which to us, in our detachment, and imagined security, sounded so quaint. Gottlieb, alas, very nearly had to make good his protestation, and did in fact suffer exile for his uncompromising defiance of Nazi philosophy in dental thought and education.

I never met him but he had a large portmanteau full of histological preparations, " Come to my room," he would say, " and I will show you something wonderful."

Arriving in Vienna from Poland as a young man with little financial backing, he became a graduate in medicine and later an associate professor of the University as well as Director of the Research Department of the College of Dentistry. He started to make perfect his histological technique for dealing with hard tissues, and in 1926 he appeared in Philadelphia with photomicrographic enlargements that shook the dental schools of America. They tried to induce him to go over there, but happily for us he stayed in his beloved city of adoption and inspired us on this side of the Atlantic by his work and enthusiasm and by his acumen.

He sent his pupils to America, and American prestige in dentistry owes much to Kronfeld and Orban, to mention only two, who, in turn, owe the foundation of their fame to Gottlieb.

The development of dental thought in this country might have moved in very different channels if Gottlieb had not brought over a box-full of slides of parodontal tissue in the late twenties, when he came on a visit, and commended their study to us. It was typical of him, too, and endeared him to us all the more, that he should storm at us because in some small matters we disagreed with him, and even greatly daring, developed theories of our own.

It is useless to enumerate the subjects he investigated, for he probed them all. Dental histology in all its aspects, especially the dental enamel and the epithelial attachment (a phrase he coined), the pathology of the devitalised tooth, tooth movement, parodontal disease, of course ; indeed, one could not mention any subject but he would

say " I will show you," and out would come an array of slides illustrating the results of his experiments and observations.

He was an honorary member of our Association and of the Royal Society of Medicine and of almost every other important dental association in the world from Holland to America and Japan. He received a couple of honorary doctorates, one of Bonn (Germany) and the other of Loyola (Chicago) and was an honorary Fellow in Dental Surgery of our Royal College of Surgeons. It would be impossible to record here his published works ; a list of one hundred or so lies before me as I write. They cover every aspect of dentistry to which the experimental method can be applied. There are books on Histology and Dental Pathology, papers written in conjunction with Sicher, Fleischmann, Greiner, Schwarz, Stein, Orban, Weinmann ; and then a break occurs.

The Anschluss came and a reign of terror ; then exile, and Gottlieb writes from Tel-Aviv : " Never will I speak again a word of German, never write one," and he set himself to improve his English and to make the dental school of Tel-Aviv the best in the world. Alas, his dream was shattered by the war and Gottlieb set out again on his wanderings, a sad, and I fear, a bitter man. He could not understand, or would not, the intricacies of our statutes by which the General Medical Council could admit pupils of his to practise here and yet exclude him ; and so he was lost to London and to Europe. After a very unhappy time he settled in Texas at Baylor University as Professor of Oral Pathology and Dental Research and got to work again, writing in English, first in conjunction again with Orban and then with Crawford, Stanton, Land, Diamond, Applebaum, Barron and Crook.

What then shall we say of him ? We may call him the first man to apply the experimental method to dentistry—and he certainly did all a man could to make us realise its importance and its possibilities—but no better epitaph could be found for this brilliant, temperamental, lovable, fiery, kind, generous and stormy man than the title of the last paper of his of which I have a record. Published in 1949, it is a simple statement of the faith that inspired his life and his work, " Oral Pathology—The Foundation of Dentistry."

MARTIN HENRY, L.D.S.Eng.

MR. MARTIN HENRY, whose death, on March 2, in his 97th year, was briefly recorded in the last issue of the Journal, was probably the oldest member of the profession in this country. He qualified from the Royal Dental Hospital in 1878, and practised in Folkestone. He was a past president of the Southern Counties Branch of the B.D.A. and vice-president of the Odontological Section of the Royal Society of Medicine in 1907-8.

Lleufer Jonathan, L.D.S.Eng., of Alma Place, Gurnos Road, Ystalyfera, was amongst those killed in the air disaster at Llandow, Glamorgan, on Sunday, March 12, when returning from the Wales *v.* Ireland rugby international He was a member of the South Wales and Monmouthshire Branch of the B.D.A. and the sympathy of his colleagues in the Branch will be extended to his wife and family in their tragic bereavement.

The Charge for Announcements of Births, Marriages and Deaths is 2s. 6d. per Line. (Approximately 8 words.) Minimum 7s. 6d.

Births

CADMAN.—On March 16, 1950, at the Eddystone Nursing Home, Southsea, to Margaret (*née* Tomkins-Russell), wife of Surgeon Lieutenant (D) A. E. Cadman, R.N., a sister for Richard.

TACKLEY.—On March 1, 1950, at the Alexandra Maternity House, N.10, to Gwendoline, wife of Oswald A. Tackley, a son (Michael Oswald).

Marriage

MACPHIE—MILNE.—On March 29, 1950, in Victoria Hall, Glasgow, Robert Anderson MacPhie, L.D.S.Glasgow, son of Mr. and Mrs. James MacPhie, Casombo, Angola, Portuguese West Africa, to Jean Muir Milne, M.A., elder daughter of the late Mr. James Milne, Architect, and of Mrs. Milne, 3, Linwood Avenue, Clarkston, Glasgow.

Our Diary

Thursday, April 13.

Bournemouth and District Section.—Annual Meeting, Grand Hotel, Fir Vale Road, Bournemouth, 8 p.m., preceded by Informal Dinner, 6.30 for 7 p.m. " Radiology—Causes of Pain and Swelling shown in X-ray Films," F. L. Ingram.

Brighton and District Section.—Annual Meeting, The Ship Hotel, Hove Street, Hove, 8 p.m. " Casual Communications."

Metropolitan Branch.—13 Hill Street, Berkeley Square, London, W.1, 7.30 p.m. " The Use of Intravenous Anæsthesia in Dental Surgery," Dr. W. S. McConnell.

Monday, April 17.

The British Society of Periodontology.—Institute of Dental Surgery, Gray's Inn Road, London, W.C.1, 5 p.m., preceded by tea, 4.30 p.m. Clinical Meeting.

Oxford Section.—Maternity Theatre, Radcliffe Infirmary, 7.45 p.m. " Pulp Reaction to Chemical and Traumatic Stimuli," Professor E. B. Manley.

Thursday, April 20.

Central Counties Branch.—Joint Meeting with Section of Odontology, Birmingham Medical Institute, Gt. Charles Street, Birmingham, 7 p.m. " Investigation and Treatment of Pain in the Face of Non-Dental Origin," Professor F. A. R. Stammers.

The Royal Dental Hospital Students' Society.—Royal Dental Hospital, Leicester Square, London, W.C.2, 5 p.m. " Some Technical Problems in the Removal of Third Molars," F. N. Doubleday.

University College Hospital Dental Society.—Medical School, University Street, London, W.C.1, 7.30 p.m. " Whither Dentistry ? " J. E. H. Duckworth.

Friday and Saturday, April 21 *and* 22.

Representative Board.—13 Hill Street, Berkeley Square, London, W.1. Friday, 2 p.m. ; Saturday, 9.30 a.m.

Friday, Saturday and Sunday, April 21, 22 *and* 23.

The Continental Dental Society.—Eastman Dental Clinic, Gray's Inn Road, London, W.C.1, Friday, 2.30 p.m. : " Root Canal Treatment," M. Walter ; Films of Dental Interest—issued by courtesy of Mr. A. Deverell, Director of the Eastman Dental Clinic and the Information Office, American Embassy. Saturday, 9.30 a.m. : " Short Report on Dental Research and Practice in the U.S.," H. J. Turkheim ; " Cavity Form with Special Reference to Abutment Gold Inlays," C. de Vere Green ; " Children's Dentistry," J. Kurer ; 2.30 p.m. : " Dental Radiology," D. A. Imrie. Sunday, 10 a.m. : Table Demonstrations.

Monday, April 24.

The Royal Society of Medicine—Odontological Section.—1 Wimpole Street, London, W.1, 5.30 p.m. Lecture by Professor Westin of Stockholm.

Tuesday, April 25.

Croydon and District Section.—Y.W.C.A., Lansdown Road, Croydon, 8.15 p.m. " Chairside Aids to Clinical Practice," G. H. Leatherman.

Preston, Leyland and Chorley Section.—Starkie House, Starkie Street, Preston, 7.30 p.m. Films by Imperial Chemical (Pharmaceuticals), Ltd.

Friday, April 28.

West Kent and District Section.—Annual Meeting, Wrotham Park Club, 8.15 p.m., preceded by informal dinner, 7.30 p.m.

Monday, May 8.

The British Society for the Study of Orthodontics.—Manson House, 26, Portland Place, London, W.1, 7.30 p.m., Demonstration Meeting.

BRITISH DENTAL JOURNAL

Communications with regard to editorial business should be addressed to THE EDITOR, *BRITISH DENTAL JOURNAL*, 13, Hill Street, Berkeley Square, London, W.1. Telephone : Grosvenor 2761. Telegrams : " Bridentics," Audley, London.

Original Articles and Letters submitted for publication are presumed to be offered to the *British Dental Journal* only, unless the contrary is stated.

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